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Survey of *Gossypium hirsutum* L. Germplasm Collections for Seed-Oil Percentage and Seed Characteristics

ARS-S-187
November 1978

AGRICULTURAL RESEARCH SERVICE • U.S. DEPARTMENT OF AGRICULTURE

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ACKNOWLEDGMENTS

Thanks are extended to R. R. Bridge, Mississippi Agricultural and Forestry Experiment Station, Delta Branch, Stoneville, Miss., for furnishing seed from the Upland germplasm collection; J. T. Wade for assistance in sample preparation and measurement of seed oil and characteristics; and H. D. Peterson for assistance in statistical analysis of the data.

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Agricultural Research Service
U.S. Department of Agriculture
in cooperation with
Texas Agricultural Experiment Station

Survey of *Gossypium hirsutum* L. Germplasm Collections for Seed-Oil Percentage and Seed Characteristics

By R. J. Kohel[1]

ABSTRACT

Seeds of the cotton germplasm collections maintained at Stoneville, Miss., and College Station, Tex., were analyzed for oil content and seed characteristics. A 10-g sample of acid-delinted, dried seeds was analyzed by the nondestructive nuclear magnetic resonance method to determine oil content. A subsample of 10 seeds was used to determine seed-coat and embryo percentages. The following characters were measured for each entry: seed-oil percentage, embryo-oil percentage, embryo percentage, seed-coat percentage, seed index, embryo index, and seed-coat index. In the regression of the other characters on seed-oil percentage, embryo-oil percentage and embryo percentage accounted for the greatest amount of variability. The results showed a wide range of variability for all characters, with the greater variability associated with the genetically more diverse Texas collection. KEYWORDS: cotton genetics, cottonseed, cottonseed characteristics, cottonseed oil, *Gossypium hirsutum* races, nuclear magnetic resonance, oils (edible), Upland cotton (*Gossypium hirsutum*).

INTRODUCTION

Three major factors determine the quality of cottonseed for current use: oil, protein, and gossypol. Increased levels of oil and protein are desirable; but gossypol, a terpenoid compound found in the dark pigment glands of the seed (*2*),[2] imposes limitations on the utilization of cottonseed products. Gossypol imparts undesirable colors that require additional processing for removal (*44*), and more important, it reacts with proteins to reduce the nutritional value of cottonseed products (*8*, *11*) and is toxic to nonruminant animals (*1*).

Two things stimulated a resurgence of interest in cottonseed quality and research on additional uses of cottonseed products: the discovery of a gland-free mutant that allows genetically for the production of cottonseed free of the gossypol-containing pigment glands (*29*, *30*), and the development of the liquid-cyclone processing technique (*13*, *14*) by which seed glands can be separated mechanically from glanded cottons. Elimination of gossypol from cottonseed products not only improves the quality of cottonseed feeds and extends their use to nonruminants, but it also can open new areas in the food industry. For example, gossypol-free cottonseed flour, or various protein fractions, can be isolated and used as meat extenders or substitutes, or beverage additives (*7*, *28*, *31*).

Utilization research has demonstrated the potential of cottonseed products, but there has not been a continued, large-scale production of gossypol-free flour for industry to use in a program of product development. Potential production problems, the absence of economic incentives, and the limited

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[2]Italic numbers in parentheses refer to items in "References" at the end of this publication.

availability of high-performance glandless cotton varieties have limited the large-scale production of glandless seed by producers. Because current cottonseed production is predominantly of glanded varieties, the production of gland-free flour from these varieties would require mechanical separation of the glands. At present, there are no facilities capable of producing gossypol-free flour.

The expanded use of cottonseed for food and feed is inevitable because of the need to maximize the efficiency and returns of our agricultural lands and because of world demand for food, especially protein. Although utilization research has produced a technological backlog of the information needed to develop new cottonseed products, the cotton breeders and geneticists do not have enough seed-quality information on the available germplasm resources to develop cottonseed-quality improvement programs. Moreover, not only is the genetic variability of cottonseed quality not known, but also the characteristics needed for new uses are not clearly defined. Cotton breeders are not able to make the adjustments demanded by new industrial uses. As more uses are developed, new parameters of seed quality will be identified, and various combinations will be desired. The geneticist must know what variability exists and how it can be manipulated to enhance seed quality and fill new needs.

We implemented studies of seed quality in 1973, for basic to any improvement program is knowledge of the available genetic variability. Two major germplasm collections are available for use in the improvement of Upland cotton, and this report represents the results of screening these collections for oil content and physical characteristics of the seed.

REVIEW

As early as 1906, Williams (*45*) published the results of a 3-year study in which he succeeded in increasing oil content by 4 percent. Eight years later, Hare (*17*) reported on his efforts to improve oil and protein content, and in 1917 Rast (*35*) surveyed the varieties and growing regions of Georgia for oil percentage and proposed the potential value for selecting varieties for high oil percentages. Apparently at that time, oil content was not a factor in cottonseed price. In 1932, Sievers and Lowman (*37*) reported on the analyses of cottonseed quality of numerous varieties grown for several years throughout the Cotton Belt as information preliminary to the development of an unspecified program for improving cottonseed oil content. I could find no further evidence of the establishment of such a breeding effort.

In 1942, Hancock (*16*) reported on the analyses of oil and nitrogen content of four cotton varieties grown for 3 years at several locations in Tennessee. He also discusses the inclusion of these seed-quality factors into plant improvement programs. Pope and Ware (*34*), in 1945, reported on the analysis of cotton varieties grown for several years at various locations in the Cotton Belt. Their analyses were concerned with seed oil and protein and fiber properties, and the way interrelations of these factors would affect an improvement program. Harland in 1949 (*18*) reported that with his mass pedigree selection program he had lines of 'Tanguis' with up to a 7-percent increase in seed oil.

These reports were prerequisite studies, but they did not result in seed-quality changes. There were no further reports or evidence that seed-quality improvement programs were pursued. There were extensive investigations of the composition of cottonseed by researchers at the Southern Regional Research Center (*38–40*), but this research was never concerned with cotton improvement. However, instrumentation for fiber properties was developed, and major breeding emphasis was placed on fiber quality.

Two major events stimulated a new interest in cottonseed quality. First was McMichael's discovery of the gland-free mutant (*29*) that provided the means to produce genetically cottonseed free of pigment glands containing gossypol. Second was the development of the liquid-cyclone processing technique (*13*, *14*) by which glands can be mechanically separated from glanded cottonseeds. The ability to remove the gossypol-containing pigment glands from cottonseeds, either genetically or mechanically, came at a time when researchers were determining the mechanisms of gossypol toxicity (*3*, *4*, *8*, *11*). Removal of glands and the associated gossypol improved the quality of cottonseed feeds, extended their use to nonruminants, and allowed the development of new uses of cottonseed protein in the food industry.

The glandless mutant was rapidly incorporated into numerous plant-breeding programs, and rapid progress was made toward the development of agronomically acceptable glandless breeding material (*12*, *23*, *33*). McMichael's original glandless material (*29*) was discovered in a nonagronomic background. Plant breeders identified and solved some of the unfavorable associations with the glandless loci, when glandless cottons were identified as having

increased susceptibility to certain insects (*17*, *21*, *32*). Many programs abandoned or deemphasized the development of glandless cotton varieties, and programs were initiated to raise the level of gossypol to increase insect resistance (*5*, *6*, *24–27*).

Because of the potential value of glandless cottonseed, many plant breeders have kept the development of the glandless seeded varieties in their programs at varying levels of emphasis. On the Texas High Plains, where cotton insects are a minor problem, cotton breeders have taken an active lead in the development of glandless varieties (*19*). Yield tests show that fiber properties and yields of new glandless varieties are competitive with glanded varieties (*36*).

Interest in seed quality is not confined to glandless cottons, but research, similar to that of the 1930's and 1940's, is being conducted to determine the genetic and environmental variability of current varieties (*9*, *10*, *22*, *41*). The California breeding program has included processing seed quality into its breeding objectives, and a glanded variety with reduced seed gossypol and increased seed oil has been released (*43*).

MATERIALS AND METHODS

Two cotton germplasm collections were surveyed. The Stoneville collection, maintained at Stoneville, Miss., contains an assortment of Upland cotton cultivars, breeding lines, and genetic stocks that represent the germplasm of cultivated Upland cotton, principally from the U.S. Cotton Belt. We had 747 entries from this collection. There was no designation of when or where the individual seed lots were produced. These entries are identified by

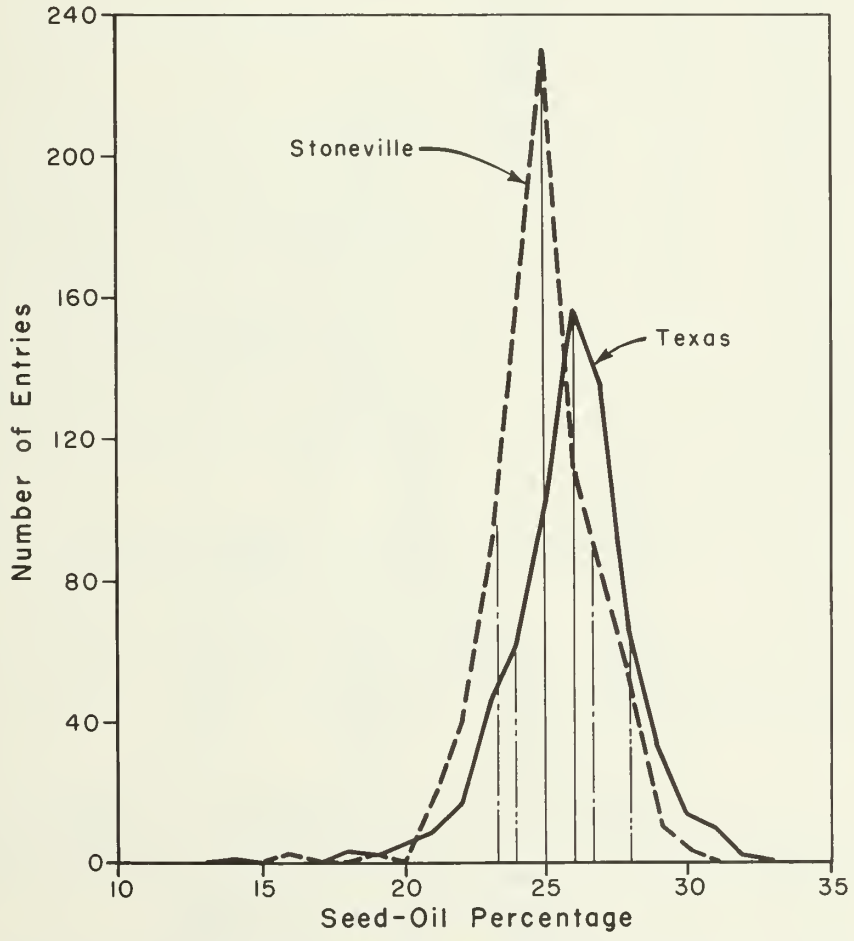

FIGURE 1.—Distribution of seed-oil percentages for the Stoneville and Texas cotton germplasm collections. The solid vertical lines represent the means, and the dashed vertical lines represent one standard deviation from the mean.

the designation SA and are listed in "The Regional Collection of *Gossypium* Germplasm" (*42*).

The Texas collection, maintained at College Station, Tex., constitutes the center-of-origin germplasm from which the modern Upland varieties have been developed. In this regard, the Stoneville collection represents a selected sample of the more diverse germpool. The Texas collection is made up of the seven geographic races of *Gossypium hirsutum* L. (*20*) that range from a few isolated entries in southwestern United States to Central America. The main center for this material is southern Mexico. The bulk of the Texas collection is short-day photoperiodic, and the seeds were produced in the Winter Cotton Garden at Iguala, Guerrero, Mexico, over a 3-year period. Most of the material was grown in the 1972–73 season (626 entries). To minimize environmental variability, statistical analyses were confined to the 626 entries grown in the single season.

A 10-g sample of acid-delinted, dried, intact seeds was used to determine the oil content by nuclear magnetic resonance (NMR) in a Newport quality analyzer. Seeds were prepared for analysis first by acid delinting to remove all lint and fuzz fibers. This procedure eliminated weight variations resulting from differences in ginning and from genetic differences in lint or fuzz density. The seeds were dried at 38° C with forced air. This standardized procedure produces a moisture equilibrium, and the remaining

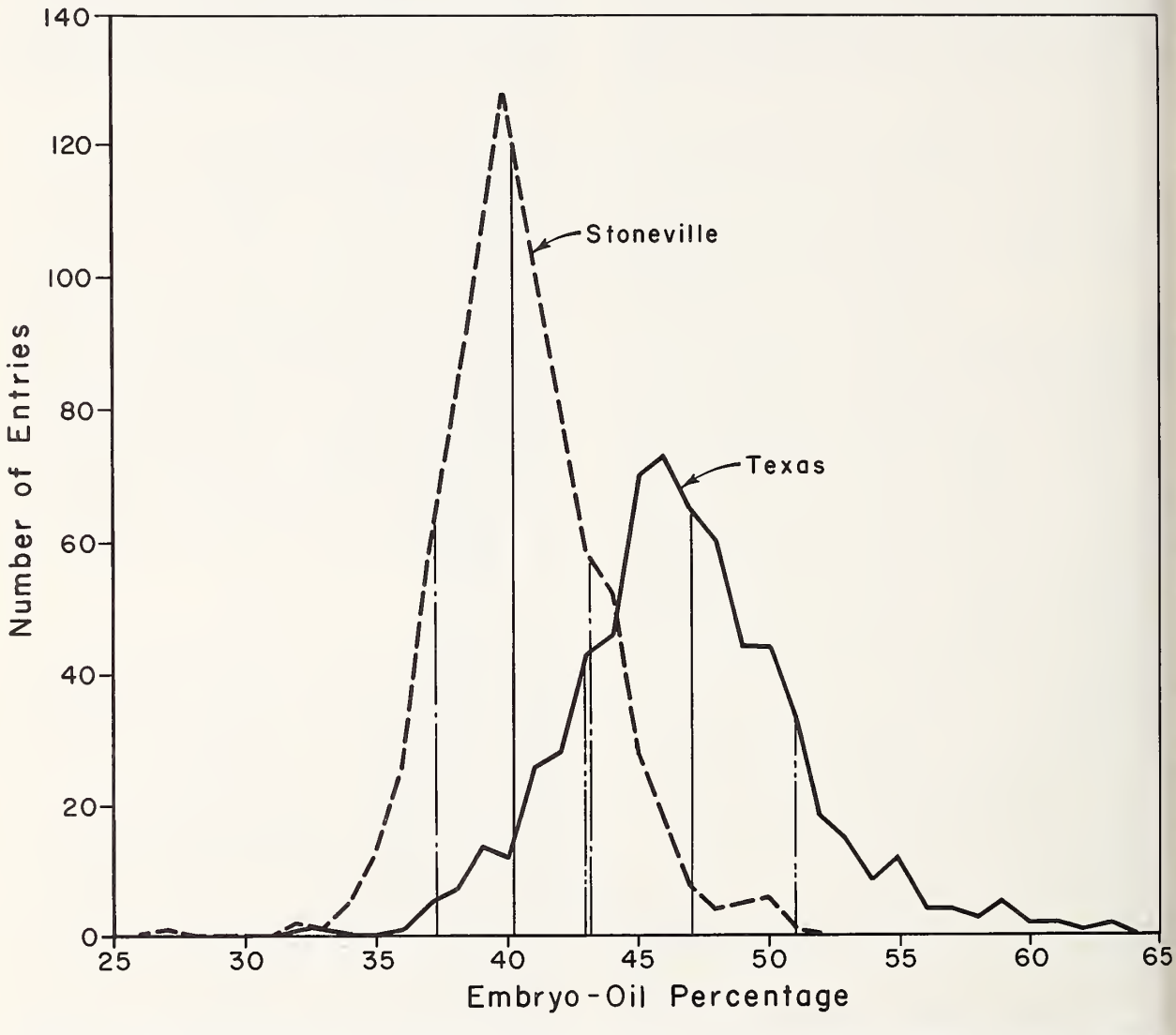

FIGURE 2.—Distribution of embryo-oil percentages for the Stoneville and Texas cotton germplasm collections. The solid vertical lines represent the means, and the dashed vertical lines represent one standard deviation from the mean.

bound water and equilibrium moisture was considered as a constant among the seed lots. Gossypol in the seed is included in the measurement of oil, but variation in gossypol content of glanded seeds is lower than the variation in the ability of the instrument to measure oil and can be disregarded as a significant source of variation.

In addition, I determined the weight of 100 seed samples and sacrificed 10 seeds to determine seed-coat and embryo weights. From these components, I was able to calculate and analyze the following parameters: seed-oil percentage (percentage of oil by weight in seeds); seed index (weight in grams of 100 acid-delinted seeds); seed-coat percentage (weight of seed coat over weight of whole seed); embryo percentage (weight of embryo over weight of whole seed); seed-coat index (weight in grams of seed coats per 100 seeds); embryo index (weight in grams of embryos per 100 seeds); and embryo-oil percentage (percentage of oil by weight in embryo).

RESULTS AND DISCUSSION

Seed Characteristics

The values for each entry are presented in table 1. The distribution of each variable has been graphically summarized. The mean seed-oil percentage of the Stoneville collection was 24.9, and for the Texas collection 25.9 (fig. 1). Not only does the Texas collection have a higher mean seed-oil value, but it also has a wider range of variability, from 13.8 to 31.5 percent, compared with 15.4 to 29.8 percent for the Stoneville collection. The greater genetic diversity of the Texas collection should be expressed in greater variability in all the characters measured.

The Stoneville collection should represent a sample of the variability present in the Texas collection that has been subjected to years of selection and modification to adapt the cotton plant to annual production of lint with little or no effort directed to the seed characteristics. Thus, it is interesting that there is little change in the mean level of seed-oil percentage.

The material from the Texas collection is classified into seven geographic races. The whole collection has not been so classified, but 270 of the entries analyzed are classified by race. I determined the mean value for six of the groups, even though the number of entries is sometimes small. The race, number of entries, and mean percentage seed-oil are: marie-galante, 7, 25; latifolium, 186, 26; punctatum, 20, 26; palmeri, 4, 26; morrilli, 45, 27; and richmondi, 8, 29. Seeds of yucatanense were not available. The range is 4 percent, which does not indicate a major deviation by race.

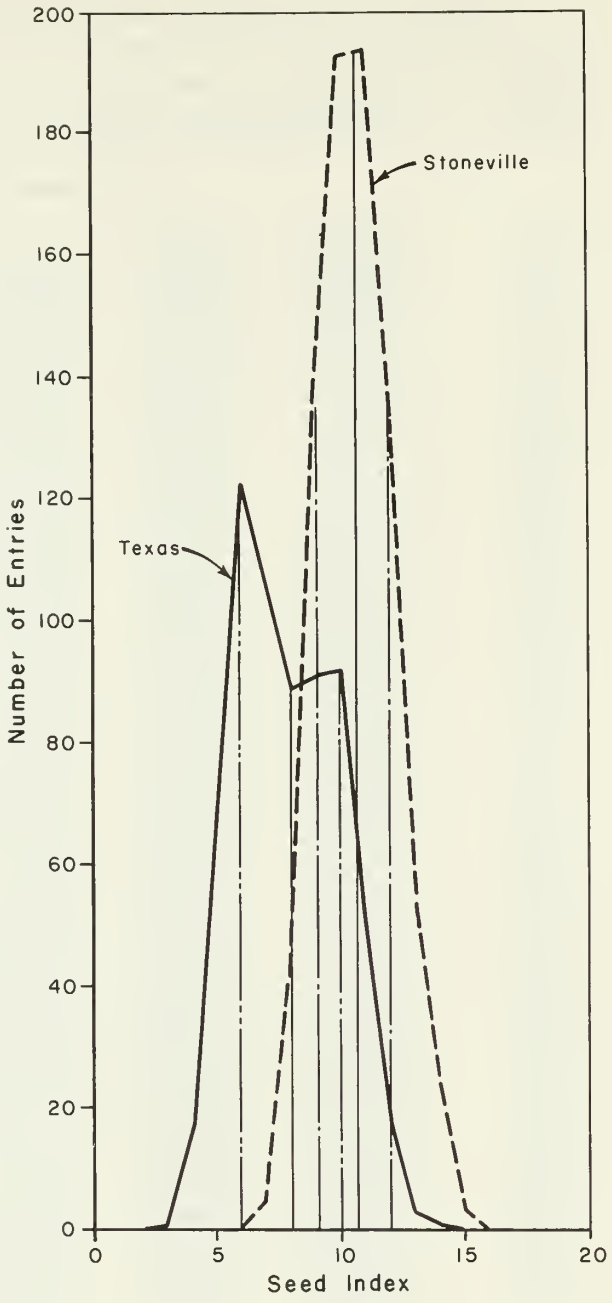

FIGURE 3.—Distribution of seed indexes for the Stoneville and Texas cotton germplasm collections. The solid vertical lines represent the means, and the dashed vertical lines represent one standard deviation from the mean.

Because cotyledons are the oil-bearing tissue of the seed, I calculated the oil content of the embryo

(*Continued on page 33.*)

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION				
SA 1	26.80	43.89	12.28	38.95	61.04	3.712	5.818
2	27.50	43.84	11.80	37.27	62.72	4.774	8.034
3	27.85	43.27	11.04	35.64	64.35	4.056	7.324
4	27.60	45.31	12.37	39.09	60.90	4.264	6.644
11	27.90	42.95	12.62	35.05	64.94	4.372	8.100
13	24.50	40.69	10.89	39.80	60.19	3.838	5.805
14	25.15	43.43	9.49	42.09	57.90	3.927	5.402
17	26.10	42.89	8.34	39.15	60.84	3.112	4.836
18	26.80	44.35	10.84	39.57	60.42	3.567	5.446
19	24.75	39.72	9.85	37.69	62.30	3.242	5.358
20	25.55	41.42	9.99	38.32	61.67	3.775	6.075
21	22.95	37.20	9.51	38.32	61.67	3.363	5.413
22	26.85	43.30	9.99	38.00	61.99	3.657	5.966
26	26.00	41.08	13.00	36.72	63.27	4.355	7.505
27	29.75	48.25	12.27	38.34	61.65	4.231	6.802
28	25.50	43.56	10.13	41.46	58.53	4.007	5.657
29	24.00	49.63	10.41	51.64	48.35	4.585	4.293
33	26.40	43.43	7.76	39.21	60.78	3.052	4.731
39	24.45	42.12	12.16	41.95	58.04	4.761	6.587
40	27.95	50.61	11.04	44.77	55.22	4.456	5.496
41	29.00	45.58	11.60	36.38	63.61	3.920	6.854
42	24.55	42.47	8.96	42.20	57.79	3.276	4.487
43	22.76	39.58	9.27	42.53	57.46	3.876	5.235
44	25.85	41.06	9.34	37.05	62.94	3.140	5.334
46	27.05	43.43	10.94	37.72	62.27	3.645	6.017
48	26.50	42.70	11.29	37.94	62.05	3.909	6.392
49	28.30	45.17	9.21	37.35	62.64	3.553	5.959
50	29.25	43.07	12.14	32.09	67.90	3.942	8.342
51	27.75	44.13	10.95	37.12	62.87	4.176	7.071
52	26.85	43.15	11.95	37.77	62.22	4.177	6.880
53	28.40	48.52	9.19	41.47	58.52	4.200	5.926
54	28.50	44.69	12.93	36.23	63.76	4.175	7.347
55	26.45	43.78	10.56	39.58	60.41	3.486	5.320
56	26.50	42.22	12.66	37.24	62.75	4.444	7.487
58	25.75	41.13	14.04	37.40	62.59	4.839	8.097
59	28.20	44.53	9.35	36.68	63.31	3.362	5.803
60	25.45	40.65	10.24	37.40	62.59	3.765	6.301
62	28.85	48.44	10.21	40.45	59.54	4.180	6.153
64	23.70	40.01	9.24	40.77	59.22	3.448	5.009
65	29.15	43.24	10.53	32.59	67.40	3.565	7.373
66	27.15	45.87	10.23	40.81	59.18	3.785	5.488
67	27.20	43.66	9.80	37.70	62.29	3.498	5.780
69	26.70	42.48	10.39	37.15	62.84	3.713	6.280
71	28.05	43.68	9.94	35.78	64.21	3.635	6.523
72	25.30	42.87	12.54	40.98	59.01	4.999	7.197
73	28.05	44.23	11.53	36.59	63.40	3.747	6.492
74	24.65	49.54	13.29	50.25	49.74	5.512	5.457
75	26.35	45.29	11.54	41.82	58.17	4.612	6.416
76	26.55	45.66	12.24	41.85	58.14	4.545	6.313
78	28.10	46.61	12.19	39.71	60.28	4.960	7.528
79	25.00	40.43	7.66	38.16	61.83	2.542	4.119
80	25.30	41.80	14.38	39.48	60.51	5.195	7.961
81	26.95	44.34	8.82	39.22	60.77	3.393	5.258
83	23.55	39.91	8.58	40.99	59.00	3.267	4.702
84	26.40	43.83	10.94	39.77	60.22	3.615	5.474
85	24.35	39.88	10.71	38.94	61.05	3.826	5.997
86	27.30	45.07	11.83	39.43	60.56	4.218	6.477

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 89	25.25	42.52	10.42	40.62	59.37	3.987	5.826
90	20.70	33.82	9.06	38.79	61.20	3.762	5.934
93	27.30	45.29	11.71	39.73	60.26	4.368	6.626
98	25.35	44.49	10.64	43.03	56.96	4.091	5.416
99	26.40	43.58	13.60	39.42	60.57	4.975	7.644
101	24.25	44.67	10.88	45.71	54.28	4.324	5.134
105	25.65	44.37	10.28	42.19	57.80	4.297	5.887
107	24.90	40.50	8.87	38.52	61.47	3.702	5.908
108	29.45	45.82	10.69	35.72	64.27	3.504	6.303
111	23.00	40.25	10.09	42.87	57.12	4.423	5.894
112	26.55	45.76	10.58	41.98	58.01	4.289	5.926
115	25.45	41.67	10.69	38.92	61.07	3.755	5.891
116	25.10	38.52	10.61	34.84	65.15	3.457	6.463
117	23.00	39.51	12.11	41.78	58.21	4.774	6.650
118	24.15	38.99	12.37	38.07	61.92	4.346	7.068
119	25.25	40.49	11.49	37.65	62.34	4.016	6.650
122	26.40	41.28	10.98	36.04	63.95	3.998	7.093
124	23.75	39.45	11.54	39.81	60.18	4.267	6.451
125	26.15	43.70	12.24	40.17	59.82	4.351	6.480
126	24.80	41.61	13.28	40.41	59.58	5.284	7.791
127	25.40	43.77	11.46	41.97	58.02	4.661	6.442
128	26.20	43.11	11.53	39.23	60.76	4.259	6.595
130	25.35	41.86	11.88	39.44	60.55	4.680	7.185
131	27.50	47.55	10.37	42.17	57.82	4.310	5.909
132	27.90	47.41	9.30	41.15	58.84	3.726	5.328
135	26.30	45.70	11.37	42.45	57.54	4.210	5.707
136	27.20	49.06	8.75	44.56	55.43	3.266	4.062
137	26.85	43.11	10.49	37.72	62.27	3.610	5.960
139	23.05	43.60	10.41	47.14	52.85	4.631	5.192
140	28.50	47.93	10.41	40.54	59.45	4.183	6.134
141	25.40	43.04	10.73	40.99	59.00	4.316	6.212
142	24.25	40.24	9.89	39.74	60.25	3.555	5.389
143	24.70	38.38	11.67	35.64	64.35	3.906	7.052
144	23.95	39.83	8.29	39.88	60.11	3.197	4.819
145	22.30	36.02	11.56	38.09	61.90	4.435	7.208
148	24.00	42.30	9.82	43.27	56.72	3.430	4.496
149	25.20	39.81	7.67	36.71	63.28	2.744	4.730
150	24.85	41.28	11.39	39.81	60.18	4.292	6.488
151	24.05	38.24	8.15	37.12	62.87	2.592	4.390
152	29.05	49.41	7.62	41.20	58.79	2.984	4.257
153	21.60	40.11	8.07	46.14	53.85	3.445	4.020
155	28.25	44.55	10.20	36.59	63.40	3.598	6.234
156	21.95	36.84	9.06	40.42	59.57	4.034	5.946
157	26.50	41.26	10.11	35.77	64.22	3.534	6.344
159	28.95	48.59	10.98	40.42	59.57	4.034	5.946
164	27.75	45.16	9.13	38.55	61.44	3.706	5.907
165	24.45	36.24	9.96	32.55	67.44	3.580	7.418
166	26.30	41.29	8.71	36.31	63.68	3.125	5.481
168	24.45	38.80	10.16	36.98	63.01	3.634	6.191
169	25.95	43.88	10.29	40.86	59.13	3.794	5.490
171	28.30	44.16	11.44	35.91	64.08	3.912	6.980
173	24.30	39.62	8.39	38.67	61.32	3.212	5.094
177	26.60	43.44	12.97	38.77	61.22	4.808	7.592
180	23.45	35.94	10.86	34.75	65.24	3.860	7.246
182	24.25	38.43	11.41	36.90	63.09	3.910	6.685
183	25.95	43.02	9.66	39.68	60.31	3.585	5.449
184	24.40	37.64	9.09	35.18	64.81	3.212	5.918

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 186	26.55	44.05	11.51	39.73	60.26	4.483	6.799
188	25.65	41.37	10.24	38.00	61.99	3.581	5.841
189	26.15	41.33	10.69	36.74	63.25	3.826	6.587
190	28.95	48.57	7.55	40.40	59.59	2.963	4.370
192	24.55	38.82	12.58	36.76	63.23	4.359	7.496
193	23.85	40.06	14.87	40.46	59.53	5.548	8.161
199	22.60	36.96	9.43	38.86	61.13	3.556	5.594
202	27.80	46.99	10.78	40.84	59.15	3.855	5.583
208	27.55	44.60	12.12	38.23	61.75	4.557	7.362
209	28.00	46.81	9.46	40.18	59.81	3.760	5.597
210	27.70	45.11	12.61	38.60	61.39	4.480	7.125
214	23.90	40.09	11.74	40.38	59.61	4.425	6.532
216	23.90	36.85	10.82	35.15	64.84	3.954	7.293
217	24.50	40.12	9.46	38.94	61.05	3.740	5.863
218	23.40	39.00	11.81	40.15	59.84	4.496	6.701
220	23.75	37.22	9.38	36.19	63.80	3.093	5.452
221	21.25	36.33	10.41	41.52	58.47	3.935	5.540
223	24.50	38.72	10.74	36.73	63.26	3.802	6.547
225	25.40	40.54	10.02	37.28	62.71	3.755	6.315
227	23.45	40.85	13.36	42.59	57.40	5.247	7.071
229	21.55	36.13	11.31	40.36	59.63	4.330	6.396
230	25.30	40.99	11.54	38.28	61.71	4.407	7.105
232	25.00	41.75	11.90	40.12	59.87	4.325	6.454
233	25.00	42.49	12.12	41.17	58.82	4.487	6.411
234	23.20	37.39	9.67	37.96	62.03	3.440	5.622
236	23.90	38.47	11.16	37.88	62.11	4.040	6.625
237	24.80	40.43	11.75	38.66	61.33	4.456	7.068
238	26.00	41.95	11.96	38.02	61.97	4.289	6.989
239	27.10	43.92	11.81	38.30	61.69	4.192	6.751
241	26.30	39.85	13.13	34.00	65.99	4.488	8.711
243	25.70	41.87	11.85	38.63	61.36	4.211	6.689
245	24.60	40.64	10.77	39.48	60.51	3.684	5.647
246	23.55	39.06	11.08	39.71	60.28	4.140	6.284
248	24.65	39.54	9.55	37.66	62.33	3.394	5.616
250	23.60	40.03	11.22	41.05	58.94	4.452	6.392
252	21.25	37.20	8.33	42.88	57.11	3.420	4.544
253	22.65	36.87	10.87	38.57	61.42	3.863	6.152
254	26.25	40.41	13.10	35.05	64.94	4.395	8.142
255	22.60	38.00	11.72	40.69	59.30	4.454	6.491
257	23.75	40.37	10.96	41.17	58.82	4.343	6.204
259	24.30	42.28	10.04	42.52	57.47	4.204	5.681
260	27.15	44.73	11.32	39.30	60.69	4.206	6.494
261	24.30	40.86	9.77	40.52	59.47	3.687	5.410
263	26.30	43.35	11.98	39.33	60.66	4.630	7.140
264	23.90	40.00	11.15	40.26	59.73	4.386	6.507
265	26.15	40.60	11.09	35.60	64.39	3.898	7.050
269	22.70	38.64	9.78	41.26	58.73	3.687	5.249
271	24.00	39.24	11.05	38.85	61.14	4.255	6.697
272	23.90	39.32	9.99	39.22	60.77	4.031	6.245
275	24.05	38.32	10.07	37.25	62.74	3.533	5.951
277	25.65	39.00	11.96	34.23	65.76	4.163	7.996
278	24.05	39.66	10.85	39.36	60.63	4.258	6.560
279	28.60	45.54	13.70	37.19	62.80	4.800	8.105
280	26.65	42.28	11.82	36.97	63.02	4.394	7.490
282	25.00	40.37	11.36	38.08	61.91	4.157	6.759
288	23.15	40.11	13.15	42.29	57.70	5.359	7.313
289	23.45	37.02	10.29	36.67	63.32	3.650	6.303

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 290	25.25	42.47	11.54	40.55	59.44	4.156	6.091
291	23.45	39.21	10.82	40.20	59.79	4.220	6.276
292	26.70	43.36	10.88	38.42	61.57	4.015	6.433
293	25.30	38.73	12.24	34.68	65.31	4.350	8.190
294	24.65	42.10	9.57	41.45	58.54	4.146	5.856
295	24.15	38.41	8.86	37.13	62.86	3.218	5.488
297	23.60	38.63	11.44	38.91	61.08	4.188	6.574
298	25.05	39.42	12.55	36.46	63.53	4.384	7.640
299	25.35	43.34	9.74	41.51	58.48	3.995	5.628
300	24.75	38.09	12.21	35.02	64.97	4.399	8.160
302	27.10	43.45	11.49	37.64	62.35	4.162	6.895
303	24.30	39.14	12.23	37.92	62.07	4.889	8.003
304	23.60	40.34	12.64	41.50	58.49	4.761	6.709
306	25.00	41.84	13.07	40.25	59.74	5.059	7.508
308	22.40	35.03	10.28	36.06	63.93	3.639	6.452
309	25.45	41.42	10.71	38.56	61.43	3.690	5.878
310	26.05	40.35	9.75	35.44	64.55	3.305	6.020
311	24.55	41.65	11.60	41.06	58.93	4.700	6.746
312	23.55	39.71	8.81	40.69	59.30	3.604	5.252
313	20.45	36.60	11.16	44.14	55.85	4.392	5.558
314	23.45	37.29	8.21	37.11	62.88	3.007	5.094
317	23.40	40.25	8.94	41.86	58.13	3.421	4.750
319	23.80	40.58	9.75	41.35	58.64	3.708	5.258
320	24.35	41.83	9.72	41.78	58.21	3.820	5.321
321	23.80	39.52	9.29	39.78	60.21	3.407	5.157
323	25.65	43.29	9.94	40.75	59.24	3.853	5.602
324	25.25	39.33	10.11	35.80	64.19	3.691	6.618
325	23.40	36.44	9.43	35.79	64.20	3.338	5.988
326	23.10	40.10	10.33	42.40	57.59	3.770	5.120
327	25.30	37.22	12.05	32.03	67.96	3.940	8.360
331	22.40	37.65	9.51	40.51	59.48	3.716	5.455
332	23.40	39.60	8.56	40.92	59.07	3.135	4.526
333	24.00	37.39	9.49	35.81	64.18	3.442	6.169
334	23.10	37.99	9.18	39.19	60.80	3.595	5.577
335	26.45	41.18	12.17	35.78	64.21	4.452	7.990
336	24.60	40.22	8.87	38.84	61.15	3.047	4.798
337	26.35	41.91	10.40	37.13	62.86	3.770	6.383
338	27.55	43.61	9.47	36.83	63.16	3.545	6.080
339	24.75	38.38	14.07	35.51	64.48	4.917	8.926
340	23.70	37.03	14.52	36.01	63.98	5.113	9.084
342	23.05	36.08	11.26	36.12	63.87	3.971	7.021
343	25.60	40.52	10.45	36.83	63.16	3.927	6.735
344	26.95	39.33	9.95	31.48	68.51	3.185	6.930
345	23.90	38.42	11.44	37.80	62.19	4.000	6.580
346	25.15	40.86	12.23	38.46	61.53	4.702	7.523
347	22.80	37.66	9.94	39.47	60.52	3.746	5.744
348	23.55	38.83	8.62	39.36	60.63	3.069	4.727
350	25.80	42.56	9.25	39.39	60.60	3.483	5.359
351	22.90	34.46	12.70	33.55	66.44	4.271	8.456
353	22.10	34.67	12.02	36.26	63.73	4.394	7.723
354	25.10	40.57	12.05	38.14	61.85	4.403	7.140
356	23.60	37.30	11.26	36.74	63.25	3.772	6.494
357	25.35	39.96	12.30	36.56	63.43	3.956	6.862
358	26.85	41.99	10.63	36.06	63.93	3.725	6.604
363	23.50	39.31	9.37	40.22	59.77	3.752	5.576
365	20.95	34.85	10.54	39.89	60.10	4.138	6.234
366	25.05	40.14	8.28	37.60	62.39	2.991	4.962

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 368	23.35	37.86	9.00	38.33	61.66	3.413	5.489
369	23.85	37.65	10.55	36.66	63.33	3.468	5.990
370	25.45	41.70	10.69	38.97	61.02	3.978	6.228
372	25.05	40.49	9.14	38.14	61.85	3.325	5.392
373	21.00	35.47	9.10	40.79	59.20	3.490	5.064
375	26.30	42.20	8.97	37.68	62.31	3.204	5.297
378	25.15	40.05	9.58	37.21	62.78	3.674	6.199
380	25.85	42.64	11.61	39.38	60.61	4.063	6.253
381	26.85	38.59	12.97	30.43	69.56	3.770	8.617
383	23.10	38.51	10.62	40.01	59.98	4.239	6.354
384	23.25	36.59	9.98	36.46	63.53	3.570	6.220
385	23.35	36.75	9.77	36.47	63.52	3.353	5.839
386	24.90	40.00	11.81	37.76	62.23	4.037	6.654
387	24.20	37.96	11.19	36.26	63.73	3.766	6.620
389	24.90	41.54	11.50	40.07	59.92	4.421	6.612
391	23.00	38.30	9.74	39.95	60.04	3.841	5.771
394	22.85	37.96	9.44	39.81	60.18	3.723	5.627
395	25.05	40.52	12.23	38.18	61.81	4.350	7.041
396	23.70	38.45	8.61	38.37	61.62	3.180	5.107
397	24.15	38.96	6.95	38.02	61.97	2.447	3.988
398	24.00	38.27	8.44	37.28	62.71	3.086	5.190
399	23.15	39.34	11.38	41.16	58.83	4.271	6.104
400	23.85	40.37	9.79	40.92	59.07	3.517	5.077
401	25.95	39.58	8.61	34.43	65.56	3.016	5.742
402	25.90	40.84	11.07	36.59	63.40	3.947	6.840
404	23.55	38.47	10.30	38.79	61.20	3.743	5.905
405	25.60	41.46	10.84	38.26	61.73	3.841	6.196
408	24.55	37.84	11.48	35.12	64.87	4.126	7.619
409	27.00	40.73	14.83	33.71	66.28	4.999	9.829
410	25.30	43.02	14.24	41.19	58.80	4.864	6.943
412	22.10	33.91	12.84	34.84	65.15	4.859	9.087
414	25.50	41.37	10.45	38.36	61.63	3.685	5.921
415	22.50	37.02	9.64	39.22	60.77	3.795	5.880
416	25.70	40.64	9.90	36.76	63.23	3.592	6.179
417	25.05	40.77	8.63	38.56	61.43	3.256	5.186
420	24.90	39.73	9.35	37.33	62.66	3.409	5.722
422	24.55	41.05	7.64	40.20	59.79	2.748	4.087
424	26.80	43.40	9.68	38.25	61.74	3.545	5.722
426	25.40	43.74	12.39	41.93	58.06	4.867	6.739
427	24.15	38.34	10.61	37.02	62.97	3.802	6.467
431	23.25	37.54	7.66	38.08	61.91	2.797	4.548
432	24.60	39.82	11.87	38.22	61.77	4.508	7.284
433	23.85	39.05	11.90	38.92	61.07	4.181	6.559
434	23.50	42.29	10.14	44.43	55.56	3.922	4.905
435	23.80	37.62	13.70	36.74	63.25	4.759	8.191
436	25.80	41.80	11.77	38.28	61.71	4.318	6.961
437	25.25	38.66	12.94	34.69	65.30	3.929	7.396
438	21.55	36.15	9.65	40.40	59.59	3.410	5.030
439	24.70	37.38	11.70	33.92	66.07	3.727	7.258
440	22.70	36.98	10.40	38.61	61.38	3.914	6.221
442	25.20	40.75	11.49	38.16	61.83	4.603	7.458
445	25.15	42.50	10.81	40.82	59.17	4.073	5.903
447	24.80	40.61	11.83	38.93	61.06	4.245	6.657
449	26.25	42.69	10.21	38.51	61.48	3.859	6.161
450	23.45	37.91	9.26	38.14	61.85	3.107	5.038
451	23.60	34.18	9.11	30.96	69.03	3.188	7.108
452	25.60	41.94	10.31	38.97	61.02	3.900	6.107

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 453	22.35	36.44	8.90	38.67	61.32	3.651	5.789
454	25.60	39.38	9.33	35.00	64.99	3.278	6.086
455	23.30	38.17	12.87	38.96	61.03	5.422	8.492
456	25.60	39.50	10.64	35.20	64.79	3.622	6.666
458	24.95	39.11	9.66	36.20	63.79	3.386	5.966
459	23.90	37.36	9.08	36.03	63.96	3.291	5.841
460	25.30	40.26	8.99	37.16	62.83	3.291	5.564
462	23.70	37.64	9.85	37.04	62.95	3.381	5.745
463	24.05	37.87	10.84	36.49	63.50	3.931	6.839
464	24.55	41.53	10.18	40.88	59.11	4.142	5.988
465	24.55	40.62	12.12	39.57	60.42	4.488	6.853
467	26.15	40.44	12.89	35.34	64.65	4.462	8.161
468	26.85	41.19	11.43	34.82	65.17	4.033	7.548
469	24.55	39.24	11.78	37.44	62.55	4.051	6.768
470	24.80	38.34	13.62	35.32	64.67	4.754	8.703
472	24.50	39.64	10.80	38.20	61.79	4.057	6.563
473	24.25	41.65	11.80	41.78	58.21	4.335	6.040
474	25.70	39.82	14.10	35.47	64.52	4.422	8.044
475	24.70	38.18	12.41	35.32	64.67	4.482	8.207
476	23.50	36.43	11.40	35.49	64.50	4.347	7.899
477	26.10	40.86	10.59	36.13	63.86	3.638	6.430
478	24.15	39.98	11.41	39.59	60.40	4.411	6.728
479	24.90	42.19	10.66	40.98	59.01	4.216	6.070
480	23.70	38.46	10.88	38.38	61.61	4.247	6.818
481	22.95	40.41	9.87	43.21	56.78	4.038	5.305
482	23.05	39.16	9.13	41.14	58.85	3.661	5.237
483	24.10	37.44	9.91	35.63	64.36	3.336	6.025
484	23.00	39.06	10.24	41.11	58.88	4.252	6.089
485	23.30	40.01	9.48	41.77	58.22	3.535	4.928
486	25.05	40.41	9.59	38.01	61.98	3.585	5.845
487	25.35	42.25	10.49	40.00	59.99	4.397	6.593
488	27.10	44.60	10.81	39.25	60.74	4.267	6.604
489	25.75	41.87	11.88	38.50	61.49	4.879	7.793
490	25.75	42.84	10.27	39.89	60.10	3.655	5.507
491	22.60	37.45	12.75	39.66	60.33	4.464	6.791
493	22.25	36.32	12.24	38.75	61.24	4.528	7.157
494	23.95	39.26	12.22	39.00	60.99	4.807	7.518
495	26.80	42.56	13.41	37.03	62.96	4.745	8.067
496	23.35	39.59	10.58	41.02	58.97	3.733	5.366
497	20.05	32.71	11.00	38.71	61.28	4.029	6.378
499	29.65	46.04	11.47	35.60	64.39	3.596	6.504
502	22.95	36.42	7.84	36.99	63.00	3.166	5.393
504	26.95	43.80	9.78	38.47	61.52	3.639	5.819
505	27.45	44.29	11.84	38.03	61.96	4.090	6.664
506	24.50	38.25	9.34	35.95	64.04	3.140	5.593
507	25.35	39.96	9.61	36.56	63.43	3.160	5.481
509	25.70	40.68	9.44	36.83	63.16	3.409	5.846
510	25.40	40.02	13.98	36.53	63.46	5.091	8.844
515	25.00	39.87	11.80	37.30	62.69	4.248	7.139
516	24.50	39.09	13.05	37.33	62.66	4.672	7.843
517	25.40	43.91	10.85	42.16	57.83	4.703	6.451
518	24.00	38.10	12.73	37.02	62.97	4.730	8.046
519	23.50	37.29	13.44	36.98	63.01	4.927	8.395
520	25.15	41.42	9.56	39.28	60.71	3.757	5.525
521	23.70	37.65	11.07	37.05	62.94	3.899	6.622
524	22.80	38.41	12.94	40.64	59.35	4.763	6.956
525	25.45	37.24	11.67	31.66	68.33	3.379	7.293

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 527	25.85	42.64	12.32	39.38	60.61	4.549	7.002
528	23.75	38.91	14.01	38.97	61.02	4.817	7.542
532	24.40	38.02	7.38	35.83	64.16	2.511	4.496
534	22.25	37.53	9.32	40.72	59.27	3.582	5.214
535	23.95	39.80	9.50	39.83	60.16	3.486	5.265
537	24.60	38.24	11.02	35.68	64.31	4.033	7.269
538	22.50	35.67	11.37	36.92	63.07	4.196	7.168
539	22.90	36.16	9.33	36.67	63.32	3.634	6.274
540	22.85	37.53	8.95	39.11	60.88	2.990	4.654
541	24.05	38.16	10.03	36.98	63.01	3.254	5.544
542	25.00	38.76	10.69	35.50	64.49	3.449	6.265
544	24.75	40.74	13.56	39.25	60.74	4.348	6.729
549	24.05	37.50	13.09	35.87	64.12	3.984	7.120
550	23.75	38.03	13.25	37.56	62.43	5.140	8.544
551	22.60	35.82	12.64	36.91	63.08	4.998	8.543
553	23.05	42.49	12.98	45.75	54.24	4.654	5.518
556	24.45	38.42	13.54	36.37	63.62	4.667	8.165
557	24.85	38.07	14.27	34.73	65.26	4.791	9.003
558	24.25	39.12	13.41	38.01	61.98	5.452	8.888
560	23.40	36.64	11.17	36.13	63.86	3.714	6.563
562	22.45	38.79	9.36	42.12	57.87	3.827	5.258
563	25.15	39.96	11.87	37.07	62.92	4.043	6.863
564	22.60	36.49	10.43	38.06	61.93	3.912	6.365
565	24.40	40.45	10.22	39.68	60.31	3.848	5.844
566	22.80	37.44	9.52	39.00	60.89	3.179	4.950
570	26.30	39.64	9.72	33.66	66.33	3.291	6.485
571	25.05	39.25	11.48	36.18	63.81	3.886	6.852
572	25.95	41.55	11.06	37.54	62.45	3.976	6.613
573	24.65	39.56	12.83	37.69	62.30	4.550	7.520
574	26.25	41.96	10.84	37.44	62.55	4.202	7.021
575	24.90	40.75	11.20	38.90	61.09	4.479	7.033
577	24.60	38.54	8.89	36.17	63.82	3.018	5.324
578	27.85	42.93	9.77	35.13	64.86	3.640	6.721
579	23.60	38.86	8.42	39.27	60.72	3.381	5.228
580	23.65	37.30	10.81	36.59	63.40	4.137	7.167
581	24.95	38.56	11.04	35.30	64.69	3.309	6.064
582	26.50	41.78	9.53	36.57	63.42	3.249	5.633
583	21.10	34.77	9.28	39.33	60.66	3.921	6.048
584	21.25	35.69	8.55	40.46	59.53	3.363	4.947
585	25.00	39.05	12.79	35.99	64.00	4.396	7.817
588	24.85	40.47	12.82	38.61	61.38	4.490	7.139
589	25.80	39.38	12.00	34.49	65.50	3.969	7.538
590	24.80	39.68	10.78	37.51	62.48	4.182	6.966
591	26.05	40.05	11.75	34.97	65.02	4.180	7.773
592	23.90	37.78	12.11	36.75	63.24	4.197	7.223
596	25.80	41.47	7.91	37.79	62.20	2.872	4.726
624A	23.90	41.16	8.07	41.93	58.06	3.569	4.942
624B	23.15	36.38	10.12	36.38	63.61	3.593	6.283
625	24.45	39.32	10.54	37.81	62.18	3.979	6.542
628	27.35	44.63	10.04	38.72	61.27	3.533	5.591
629	24.50	42.72	8.12	42.66	57.33	2.991	4.020
631	22.10	36.13	10.18	38.84	61.15	3.797	5.867
633	25.85	42.58	9.96	39.29	60.70	3.856	5.957
634	27.20	44.20	10.09	38.49	61.50	3.560	5.689
668A	23.75	36.34	8.37	34.65	65.34	2.867	5.407
668B	24.75	38.40	12.35	35.56	64.43	4.666	8.455
669A	22.15	35.89	9.63	38.29	61.70	3.615	5.826
669B	23.35	37.28	9.07	37.37	62.62	2.973	4.982
669C	23.75	37.39	10.68	36.48	63.51	3.830	6.667

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 675	26.65	40.03	11.44	33.43	66.56	3.746	7.457
677	23.75	38.50	12.18	38.31	61.68	4.701	7.568
680	24.10	39.29	10.83	38.67	61.32	4.437	7.037
685	20.75	37.58	7.48	44.78	55.21	3.012	3.713
686	26.85	40.91	11.14	34.38	65.61	3.927	7.494
688	24.30	37.13	11.93	34.56	65.43	4.214	7.977
694	22.95	36.27	11.72	36.73	63.26	4.291	7.391
698	22.70	34.52	10.84	34.25	65.74	3.668	7.041
699	24.70	41.17	8.93	40.00	59.99	3.460	5.188
700	24.05	36.48	9.42	34.08	65.91	3.245	6.275
702	24.45	38.78	10.92	36.96	63.03	3.977	6.781
708	23.70	36.42	11.16	34.94	65.05	4.052	7.545
709	22.40	35.43	9.77	36.78	63.21	3.826	6.576
710	24.70	39.21	11.36	37.02	62.97	3.189	5.425
713	23.25	36.91	12.29	37.02	62.97	4.645	7.902
714	24.75	37.02	12.20	33.14	66.85	4.117	8.303
715	21.15	37.59	9.77	43.74	56.25	3.887	4.998
716	22.15	36.10	9.57	38.64	61.35	3.728	5.918
717	24.10	38.26	11.77	37.02	62.97	4.589	7.807
718	23.10	36.34	11.03	36.43	63.56	3.931	6.857
720	24.95	40.26	11.83	38.02	61.97	4.227	6.888
724	24.30	42.20	9.09	42.41	57.58	3.796	5.153
726	25.30	40.89	10.47	38.13	61.86	4.227	6.856
727	22.40	35.63	10.75	37.13	62.86	4.166	7.052
728	24.00	40.91	12.30	41.33	58.66	4.553	6.461
729	24.55	38.02	12.29	35.42	64.57	4.496	8.194
730	21.05	34.10	11.83	38.27	61.72	4.752	7.664
732	22.55	35.19	13.39	35.92	64.07	4.106	7.324
733	23.55	38.63	10.52	39.04	60.95	3.753	5.860
734	23.10	36.93	10.54	37.46	62.53	3.991	6.663
736	24.40	37.87	10.63	35.58	64.41	3.650	6.608
738	26.30	40.89	10.56	35.68	64.31	4.123	7.432
739	25.50	39.22	10.39	34.99	65.00	3.538	6.572
743	23.85	39.58	9.77	39.74	60.25	4.411	6.688
745	25.40	41.33	11.36	38.55	61.44	4.618	7.360
746	25.55	39.27	10.32	34.93	65.06	2.996	5.579
747	26.70	41.09	12.00	35.02	64.97	3.876	7.190
815	25.65	40.09	13.04	36.02	63.97	4.561	8.101
818	25.05	40.20	9.57	37.69	62.30	3.643	6.021
825	15.45	27.00	7.96	42.78	57.21	3.157	4.222
826	27.00	44.73	9.56	39.64	60.35	3.829	5.828
830	24.30	42.11	11.57	42.30	57.69	4.264	5.815
831	24.80	43.33	11.00	42.77	57.22	4.567	6.111
832	24.85	40.00	10.35	37.87	62.12	3.797	6.228
833	24.25	39.35	9.49	38.37	61.62	3.576	5.742
834	24.50	39.50	9.44	37.98	62.01	3.386	5.527
838	25.75	41.30	9.35	37.66	62.33	3.657	6.053
840	21.30	37.07	8.06	42.54	57.45	3.425	4.625
844	25.60	40.66	10.61	37.05	62.94	3.467	5.890
846	22.65	36.15	10.87	37.34	62.65	3.807	6.386
847	26.90	42.23	11.99	36.30	63.69	4.100	7.192
848	27.40	42.73	10.36	35.87	64.12	3.690	6.595
850	25.35	40.22	10.90	36.98	63.01	3.942	6.717
854	23.20	39.82	10.24	41.74	58.25	3.553	4.959
857	24.10	38.82	8.92	37.93	62.06	3.281	5.369
859	25.40	42.47	7.96	40.19	59.80	3.431	5.105
861	25.55	41.40	11.20	38.28	61.71	3.855	6.214

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 862	24.75	39.59	9.79	37.48	62.51	3.341	5.571
864	24.60	41.26	9.32	40.38	59.61	3.626	5.352
865	25.00	37.92	11.56	34.07	65.92	3.856	7.461
866	26.35	39.97	11.61	34.08	65.91	3.828	7.402
868	24.80	40.40	10.54	38.62	61.37	3.447	5.477
869	26.25	38.97	13.50	32.65	67.34	4.116	8.488
870	25.00	43.42	10.25	42.42	57.57	3.533	4.795
874	24.95	39.69	10.25	37.13	62.86	3.615	6.120
875	20.90	31.54	7.77	33.73	66.26	3.220	6.325
876	24.70	39.55	11.28	37.55	62.44	3.847	6.396
877	27.65	45.58	11.93	39.34	60.65	3.886	5.990
879	23.05	37.00	11.03	37.71	62.28	4.728	7.809
880	26.85	41.04	12.27	34.58	65.41	3.990	7.546
881	24.20	36.87	12.66	34.37	65.62	4.520	8.630
882	26.35	41.22	10.60	36.08	63.91	3.671	6.503
883	25.75	40.10	10.22	35.79	64.20	3.718	6.670
884	24.95	38.80	10.98	35.71	64.28	3.935	7.084
885	24.60	39.95	11.51	38.43	61.56	4.385	7.023
887	27.80	45.29	10.35	38.62	61.37	3.790	6.022
889	23.65	38.61	11.56	38.75	61.24	3.846	6.079
890	22.95	37.00	11.72	37.97	62.02	4.573	7.468
891	24.00	37.73	12.20	36.39	63.60	4.354	7.608
892	25.05	41.02	13.38	38.92	61.07	4.933	7.740
895	28.00	42.00	13.55	33.33	66.66	4.225	8.450
897	23.85	36.34	8.55	34.37	65.62	2.639	5.038
899	24.10	37.49	9.55	35.71	64.28	3.257	5.862
903	22.35	35.21	9.30	36.52	63.47	3.218	5.592
904	27.15	42.78	9.83	36.53	63.46	3.201	5.560
905	27.60	43.41	9.76	36.43	63.56	3.127	5.456
907	26.60	40.84	12.90	34.87	65.12	4.476	8.360
923	26.15	40.43	11.48	35.33	64.66	3.934	7.201
924	25.15	39.41	8.25	36.18	63.81	2.987	5.267
925	24.95	38.96	10.00	35.96	64.03	3.392	6.039
926	21.45	37.91	9.26	43.43	56.56	3.345	4.357
928	24.80	38.22	11.14	35.11	64.88	3.933	7.268
929	25.85	44.55	11.44	41.98	58.01	4.353	6.016
930	24.90	41.59	13.17	40.13	59.86	4.851	7.236
933	28.25	44.97	11.37	37.18	62.81	3.482	5.883
935	23.45	37.94	10.80	38.19	61.80	4.224	6.834
936	26.35	41.83	9.38	37.01	62.98	3.116	5.302
937	23.15	37.34	9.14	38.01	61.98	4.225	6.890
938	26.40	41.49	10.57	36.38	63.61	3.979	6.957
939	24.25	40.01	9.46	39.39	60.60	3.267	5.025
940	24.90	40.42	9.14	38.40	61.59	3.424	5.491
941	24.90	41.15	9.86	39.49	60.50	3.698	5.666
942	27.75	42.28	10.05	34.36	65.63	3.334	6.367
943	22.80	39.09	10.74	41.67	58.32	4.317	6.041
944	27.35	47.20	10.90	42.05	57.94	4.210	5.800
945	23.65	36.74	8.96	35.63	64.36	3.365	6.079
946	27.05	40.58	13.92	33.34	66.65	4.397	8.788
947	26.70	43.84	10.89	39.09	60.90	3.810	5.935
948	27.05	46.38	11.11	41.67	58.32	4.195	5.870
949	25.90	41.89	11.94	38.18	61.81	4.596	7.441
950	26.15	43.58	9.83	39.99	60.00	3.536	5.305
952	27.80	44.95	11.64	38.15	61.84	4.126	6.688
953	26.05	43.23	10.24	39.74	60.25	4.806	7.286
954	24.65	44.81	10.61	44.99	55.00	3.840	4.694

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
STONEVILLE COLLECTION--Continued							
SA 955	25.35	41.65	10.56	39.14	60.85	3.696	5.747
956	27.15	45.42	11.80	40.22	59.77	4.287	6.370
957	24.30	39.23	10.84	38.06	61.93	3.747	6.096
959	25.45	39.93	10.58	36.27	63.72	3.831	6.729
960	24.60	39.46	9.15	37.66	62.33	3.468	5.739
961	24.15	39.88	8.81	39.44	60.55	3.454	5.302
962	23.05	36.01	9.14	36.00	63.99	3.558	6.324
963	25.70	40.22	12.24	36.11	63.88	5.095	9.013
964	26.80	42.79	12.04	37.37	62.62	4.292	7.192
966	26.70	43.32	10.84	38.37	61.62	4.142	6.651
967	26.90	41.36	14.69	34.96	65.03	4.352	8.095
968	24.75	41.41	11.64	40.23	59.76	4.492	6.672
969	25.85	42.81	9.58	39.63	60.36	3.753	5.717
970	26.10	40.69	11.20	35.86	64.13	3.889	6.954
971	23.15	38.31	8.58	39.58	60.41	3.186	4.862
972	24.45	39.66	10.71	38.35	61.64	3.593	5.774
974	24.35	37.86	11.11	35.69	64.30	4.236	7.631
977	24.50	40.55	8.64	39.58	60.41	3.250	4.961
978	24.15	42.15	10.74	43.12	56.87	5.156	6.801
979	25.30	39.72	11.89	36.31	63.68	4.192	7.350
980	24.75	39.13	9.62	36.75	63.24	3.518	6.053
982	24.95	39.89	8.80	37.46	62.53	3.019	5.039
983	24.75	41.46	10.30	40.30	59.69	3.479	5.152
984	28.15	45.21	11.49	37.74	62.25	3.864	6.373
986	26.00	42.56	10.35	38.91	61.08	3.574	5.610
987	25.95	41.53	10.51	37.51	62.48	4.286	7.138
991	25.70	40.70	12.01	36.86	63.13	4.251	7.280
993	25.95	43.83	10.49	40.79	59.20	4.642	6.737
994	26.65	40.65	11.54	34.45	65.54	3.841	7.308
995	27.15	40.86	14.20	33.56	66.43	4.502	8.912
996	24.00	38.21	11.30	37.19	62.80	4.271	7.212
997	24.90	38.85	11.61	35.90	64.09	4.279	7.637
998	26.40	47.14	10.28	43.99	56.00	4.214	5.364
999	26.75	41.89	10.00	36.15	63.84	3.513	6.204
1000	26.13	44.02	13.38	40.64	59.35	4.491	6.558
1001	25.55	39.48	11.73	35.29	64.70	4.066	7.455
1002	24.85	38.84	9.25	36.03	63.97	3.208	5.696
1004	24.15	37.50	12.49	35.60	64.39	4.410	7.977
1005	23.85	38.17	13.63	37.53	62.46	4.915	8.181
1006	21.90	34.67	12.23	36.83	63.16	4.758	8.159
1007	26.65	42.78	12.44	37.71	62.28	4.219	6.968
1008	22.95	36.09	14.01	36.42	63.57	4.519	7.889
1009	25.05	37.71	11.07	33.58	66.41	3.302	6.531
1010	25.85	38.86	12.88	33.49	66.50	4.436	8.808
1011	25.75	40.99	11.79	37.18	62.81	4.412	7.452
1012	22.35	35.88	9.11	37.71	62.28	3.495	5.771
1013	22.45	36.28	10.77	38.12	61.87	3.836	6.225
1014	25.05	38.28	12.88	34.57	65.42	4.328	8.191
1015	27.35	42.55	11.68	35.72	64.27	4.085	7.348
1016	22.65	37.75	12.46	40.00	60.00	4.968	7.452
1019	26.00	41.43	10.87	37.25	62.74	3.700	6.231
1020	25.75	40.72	11.84	36.77	63.22	4.435	7.626
1022	23.95	36.37	10.73	34.16	65.83	3.991	7.690
1023	24.65	38.98	13.45	36.77	63.22	5.153	8.859
1025	22.05	34.98	11.97	36.98	63.01	4.522	7.706
1026	24.90	37.63	11.41	33.83	66.16	3.867	7.563
1027	23.50	36.85	11.79	36.23	63.76	4.244	7.469

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 1028	26.70	43.47	10.18	38.59	61.40	3.516	5.595
1029	24.30	39.77	9.49	38.90	61.09	3.454	5.424
1030	21.70	35.69	9.03	39.20	60.70	3.294	5.109
1031	23.50	37.01	9.59	36.51	63.48	3.621	6.296
1032	24.55	38.66	10.02	36.50	63.49	3.405	5.922
1033	24.45	37.24	10.83	34.35	65.64	3.776	7.216
1034	26.55	40.96	10.92	35.18	64.81	3.636	6.697
1035	26.15	42.60	9.70	38.62	61.37	3.477	5.524
1036	25.25	38.37	9.25	34.19	65.80	3.186	6.131
1037	24.10	37.20	9.72	35.22	64.77	3.167	5.825
1038	25.35	38.89	11.14	34.81	65.18	3.871	7.247
1039	22.10	37.22	9.87	40.63	59.36	3.758	5.490
1041	26.20	42.39	11.84	38.19	61.80	4.620	7.475
1042	25.20	40.77	10.89	38.19	61.80	3.643	5.894
1043	23.40	41.50	11.65	42.61	56.38	4.446	5.747
1044	23.65	39.36	13.14	39.92	60.07	5.226	7.865
1045	25.90	42.36	12.64	38.85	61.14	4.801	7.554
1046	24.35	38.25	10.90	36.35	63.64	4.149	7.265
1047	23.90	37.93	10.54	37.00	62.99	3.638	6.194
1048	24.60	39.78	11.86	38.16	61.83	4.338	7.027
1049	24.85	40.17	13.46	38.14	61.85	5.090	8.253
1050	26.70	46.35	10.05	42.40	57.59	4.431	6.018
1051	25.45	40.84	11.13	37.69	62.30	4.183	6.914
1052	24.75	41.30	10.42	40.08	59.91	3.938	5.887
1054	22.50	35.45	7.80	36.53	63.46	3.279	5.695
1055	24.15	38.34	9.44	37.01	62.98	3.266	5.557
1056	19.10	32.23	8.31	40.74	59.25	3.511	5.107
1057	22.15	35.16	10.02	37.01	62.98	3.764	6.405
1058	22.70	35.58	10.30	36.21	63.78	3.785	6.666
1059	26.70	46.50	12.04	42.58	57.41	4.789	6.457
1060	20.75	34.27	8.96	39.45	60.54	3.331	5.112
1061	23.80	36.68	10.17	35.11	64.88	3.402	6.285
1062	24.60	41.34	9.50	40.50	59.49	3.320	4.876
1063	25.60	42.02	9.94	39.08	60.91	3.569	5.563
1064	24.80	38.28	10.52	35.22	64.77	3.790	6.969
1066	24.05	40.10	10.37	40.02	59.97	3.836	5.747
1067	25.55	40.73	11.43	37.27	62.72	4.294	7.226
1068	23.60	39.73	8.81	40.60	59.39	3.220	4.710
1069	27.90	43.75	8.74	36.23	63.76	3.291	5.792
1070	23.70	37.09	11.28	36.10	63.89	4.146	7.336
1071	24.80	38.86	12.68	36.18	63.81	4.321	7.620
1072	23.70	39.02	8.50	39.26	60.73	3.023	4.676
1073	23.40	37.63	10.01	37.82	62.17	3.611	5.935
1074	22.35	34.82	10.06	35.82	64.17	3.465	6.208
1075	23.90	38.20	9.51	37.44	62.55	3.245	5.422
1076	23.95	37.85	10.60	36.73	63.26	3.586	6.175
1077	25.00	39.21	10.32	36.24	63.75	3.489	6.136
1078	26.85	41.31	11.87	35.00	64.99	4.254	7.897
1079	22.95	37.92	8.95	39.48	60.51	3.107	4.762
1080	24.30	35.63	9.64	31.80	68.19	3.355	7.195
1082	25.35	40.36	9.32	37.19	62.80	3.238	5.468
1083	24.65	38.72	10.64	36.33	63.66	3.801	6.659
1084	27.30	42.63	10.43	35.96	64.04	3.682	6.557
1085	24.90	42.28	10.05	41.11	58.88	3.786	5.422
1086	23.70	39.67	10.54	40.26	59.73	3.549	5.265
1087	23.85	37.14	10.44	35.79	64.20	3.931	7.051
1088	23.00	36.32	9.73	36.68	63.31	3.773	6.513
1089	22.05	36.20	9.83	39.08	60.92	3.846	5.996
1090	26.90	43.80	9.88	38.58	61.41	3.764	5.990

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 1091	22.05	34.21	9.53	35.54	64.45	3.250	5.893
1092	23.90	41.17	10.37	41.95	58.04	4.325	5.984
1093	23.95	38.44	10.72	37.70	62.29	3.488	5.762
1094	23.40	39.05	8.57	40.07	59.92	3.335	4.986
1100	22.10	40.45	9.99	45.36	54.63	4.233	5.097
1101	24.15	38.71	10.21	37.61	62.38	3.532	5.857
1103	22.75	36.74	11.40	38.09	61.90	4.048	6.579
1104	25.10	40.56	10.07	38.13	61.86	3.902	6.331
1105	24.50	40.64	11.39	39.72	60.27	4.255	6.456
1106	23.35	39.58	9.29	41.01	58.98	3.516	5.056
1107	23.45	37.25	10.56	37.05	62.94	4.183	7.106
1108	23.10	37.91	9.94	39.08	60.91	3.400	5.300
1109	25.70	40.62	13.66	36.73	63.26	4.986	8.856
1110	23.25	38.40	8.48	39.46	60.53	3.296	5.056
1111	23.50	37.73	11.02	37.06	62.93	3.763	6.390
1113	23.70	36.70	11.11	35.43	64.56	4.018	7.320
1116	25.15	39.61	10.10	36.50	63.49	3.579	6.244
1117	27.40	41.43	12.46	33.87	66.12	4.243	8.281
1119	25.75	39.79	12.73	35.28	64.71	4.470	8.198
1120	24.85	39.20	11.18	36.61	63.38	3.743	6.480
1121	23.30	36.70	8.98	36.52	63.47	3.434	5.968
1122	25.00	40.14	12.60	37.73	62.26	4.356	7.189
1123	24.55	41.98	10.19	41.52	58.47	3.403	4.793
1125	23.15	37.98	12.30	39.04	60.95	4.578	7.146
1126	24.80	39.71	12.59	37.55	62.44	4.376	7.275
1127	25.70	39.99	11.79	35.74	64.25	4.226	7.596
1128	22.35	37.35	9.88	40.17	59.82	5.725	5.548
1132	24.50	40.40	13.36	39.35	60.64	4.661	7.181
1133	23.55	38.29	12.53	38.51	61.48	4.396	7.019
1134	25.50	41.35	10.89	38.34	61.65	4.211	6.771
1135	23.20	36.87	10.53	37.08	62.91	4.461	7.568
1136	24.70	37.60	12.13	34.32	65.67	3.693	7.066
1137	26.25	41.92	12.28	37.38	62.61	4.288	7.183
1138	24.50	38.72	11.28	36.73	63.26	4.075	7.019
1139	24.65	40.29	10.67	38.82	61.17	3.964	6.246
1141	22.00	36.96	11.44	40.48	59.51	4.962	7.294
1142	23.65	40.28	10.69	41.29	58.70	4.487	6.380
1143	24.80	40.40	10.58	38.61	61.38	4.013	6.379
1144	26.25	42.21	11.73	37.82	62.17	4.549	7.479
1145	24.20	41.18	10.46	41.24	58.75	3.749	5.341
1146	24.75	39.84	10.27	37.88	62.11	3.590	5.886
1147	25.15	40.71	10.38	38.23	61.76	3.653	5.901
1148	23.60	38.71	10.96	39.04	60.95	4.664	7.282
1149	25.35	39.71	11.72	36.16	63.83	4.246	7.405
1150	25.85	39.07	9.45	33.84	66.15	3.368	6.584
1151	26.80	41.13	10.84	34.84	65.15	3.316	6.200
1153	25.30	40.96	9.34	38.24	61.75	3.430	5.539
1154	24.70	39.76	10.53	37.87	62.12	3.881	6.365
1155	24.55	38.85	12.18	36.81	63.18	4.390	7.533
1157	25.05	38.91	11.92	35.63	64.36	3.964	7.160
1158	26.30	40.59	12.90	35.20	64.79	4.813	8.858
1159	24.35	39.28	9.94	38.01	61.98	3.846	6.271
1161	24.30	38.34	9.56	36.63	63.36	3.392	5.867
1162	22.95	36.91	9.66	37.82	62.17	3.547	5.831
1163	22.50	36.31	8.95	38.03	61.96	3.463	5.642
1164	24.55	40.28	9.58	39.05	60.94	3.541	5.526
1166	26.00	44.55	11.02	41.63	58.36	4.251	5.958

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 1167	27.50	44.19	8.82	37.77	62.22	2.987	4.920
1168	27.70	48.02	10.09	42.32	57.67	3.986	5.432
1169	29.10	45.94	11.31	36.66	63.33	4.037	6.975
1171	24.05	40.63	7.90	40.81	59.18	3.027	4.389
1172	24.70	41.72	8.51	40.80	59.19	3.165	4.591
1173	25.00	41.61	9.11	39.92	60.07	3.410	5.132
1174	24.45	39.87	7.24	38.68	61.31	2.414	3.826
1175	26.65	39.54	10.17	32.60	67.39	3.305	6.832
1176	26.20	38.69	10.65	32.29	67.70	3.168	6.642
1177	24.15	38.98	9.25	38.05	61.94	3.318	5.400
1178	25.85	41.75	11.00	38.08	61.91	3.961	6.439
1179	25.80	41.32	9.63	37.57	62.42	3.752	6.234
1180	24.90	41.50	9.76	40.00	59.99	3.647	5.469
1181	23.95	39.62	10.54	39.55	60.44	4.102	6.269
1182	26.30	40.36	7.66	34.83	65.16	2.793	5.224
1183	22.65	38.82	8.23	41.66	58.33	3.043	4.261
1184	23.25	38.34	7.85	39.36	60.63	2.738	4.217
1185	25.65	40.73	8.74	37.02	62.97	3.300	5.613
1186	24.90	40.16	8.70	38.01	61.98	3.118	5.085
1187	22.95	37.94	7.97	39.51	60.48	3.069	4.698
1188	24.40	41.04	7.64	40.54	59.45	2.960	4.340
1189	23.45	38.84	8.05	39.62	60.37	3.306	5.037
1190	22.55	39.02	8.97	42.22	57.77	3.656	5.003
1191	23.90	38.78	8.96	38.37	61.62	3.312	5.318
1193	23.85	37.85	10.20	36.98	63.01	3.254	5.544
1194	25.75	41.25	10.54	37.57	62.42	3.705	6.154
1195	25.50	39.26	11.18	35.05	64.94	3.712	6.877
1196	28.35	45.09	11.59	37.13	62.86	4.106	6.950
1197	25.65	39.48	11.18	35.04	64.95	3.791	7.028
1198	23.55	37.52	9.49	37.23	62.76	3.400	5.730
1199	24.80	39.60	9.33	37.37	62.62	3.318	5.559
1200	24.60	39.83	9.06	38.24	61.75	3.720	6.008
1201	24.60	38.45	8.91	36.02	63.97	3.062	5.437
1202	24.90	37.99	9.96	34.47	65.52	3.412	6.486
1203	24.25	41.98	10.78	42.24	57.75	4.067	5.561
1204	24.30	40.02	9.66	39.28	60.71	3.355	5.185
1205	24.65	39.51	9.07	37.62	62.37	3.396	5.631
1206	24.00	38.67	9.37	37.94	62.05	3.439	5.624
1207	23.90	37.91	10.86	36.96	63.03	3.668	6.255
1208	25.35	42.29	8.67	40.06	59.93	3.263	4.881
1209	25.30	39.29	13.86	35.61	64.38	4.647	8.401
1210	24.80	39.44	10.16	37.13	62.86	3.423	5.795
1211	27.65	42.62	11.32	35.13	64.86	3.793	7.003
1212	26.60	43.21	11.36	38.45	61.54	3.765	6.026
1213	26.15	39.56	10.92	33.91	66.08	3.022	5.889
1214	25.20	40.04	10.44	37.06	62.93	3.391	5.758
1215	23.20	37.77	9.98	38.58	61.41	3.874	6.165
1216	23.45	37.44	9.85	37.36	62.63	3.568	5.981
1217	23.45	37.56	9.20	37.57	62.42	3.366	5.593
1218	26.35	41.07	10.36	35.84	64.15	3.476	6.220
1219	25.35	49.63	9.79	48.92	51.07	4.188	4.372
1220	26.45	41.29	10.18	35.95	64.04	3.822	6.808
1221	25.00	39.85	10.44	37.27	62.72	3.540	5.957
1222	23.65	39.13	10.96	39.56	60.43	3.979	6.078
1223	24.00	39.05	9.82	38.54	61.45	3.538	5.640
1224	25.35	39.78	9.38	36.27	63.72	3.221	5.658
1225	24.10	40.13	11.48	39.95	60.04	4.453	6.692

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			STONEVILLE COLLECTION--Continued				
SA 1226	23.50	38.01	9.69	38.18	61.81	2.893	4.683
1228	26.45	41.44	10.17	36.18	63.81	3.305	5.828
1229	27.10	42.39	9.78	36.07	63.92	3.381	5.992
1257	23.00	40.69	8.38	43.48	56.51	3.196	4.153
1258	26.65	44.51	9.43	40.12	59.87	3.488	5.204
1259	26.10	49.83	8.50	47.62	52.37	3.811	4.191
1261	27.35	45.17	9.88	39.46	60.53	3.086	4.734
1301	24.50	40.21	8.68	39.07	60.93	3.531	5.507
1302	24.70	40.01	9.12	38.26	61.74	3.376	5.447
1303	22.80	36.01	9.50	36.69	63.31	3.620	6.247
1304	25.40	40.09	10.19	36.64	63.36	3.582	6.195
1305	28.55	45.71	7.45	37.54	62.46	2.866	4.768
1306	28.20	44.70	8.91	36.92	63.08	3.019	5.159
1307	27.05	43.61	8.49	37.97	62.03	3.129	5.111
1308	27.00	43.17	8.83	37.45	62.55	3.352	5.598
1309	27.35	42.24	8.31	35.25	64.75	2.954	5.427
1310	27.30	43.27	7.74	36.91	63.09	3.390	5.794
1311	23.55	38.94	9.58	39.59	60.41	3.469	5.293
1312	25.55	42.41	9.36	39.76	60.24	3.865	5.856
1313	27.15	41.70	8.57	34.89	65.11	2.724	5.084
1314	25.35	39.96	8.68	36.56	63.43	3.296	5.718
1315	26.75	43.77	9.82	38.88	61.11	3.506	5.595
1316	25.60	40.22	9.30	36.35	63.65	3.217	5.634
1317	26.60	40.96	9.94	35.06	64.94	3.535	6.549
1318	27.70	45.61	9.48	39.26	60.74	3.376	5.222
1319	25.45	42.95	9.43	40.75	59.25	3.315	4.820
1320	25.50	42.73	7.68	40.32	59.68	2.765	4.093
1321	25.60	41.31	9.89	38.04	61.96	3.615	5.889
1322	25.05	39.91	8.81	37.23	62.77	3.384	5.706
1323	24.15	40.88	9.11	40.93	59.07	3.163	4.565
1324	25.15	39.43	9.49	36.22	63.78	3.195	5.627
1325	25.20	40.29	9.49	37.45	62.55	3.362	5.615
1326	27.40	43.44	8.19	36.93	63.07	2.986	5.100
1327	27.70	43.52	8.93	36.36	63.64	3.259	5.705
1328	26.50	44.13	9.38	39.96	60.04	3.489	5.243
1329	26.45	42.74	8.95	38.12	61.88	3.258	5.289
1330	27.05	43.23	8.57	37.43	62.56	3.164	5.288
1331	28.50	44.76	8.64	36.33	63.67	3.470	6.082
1332	27.80	44.05	9.73	36.90	63.10	3.456	5.911
1333	26.10	42.97	8.89	39.26	60.74	3.351	5.184
1334	26.65	45.33	7.94	41.21	58.79	2.893	4.780
1335	29.25	45.85	8.97	36.20	63.79	3.327	5.862
			TEXAS COLLECTION, 1972-73 IGUALA SEED				
TX 1	25.91	51.97	6.83	50.13	49.86	3.231	3.214
2	24.79	41.80	11.43	40.68	59.31	5.083	7.412
3	23.90	43.82	8.51	45.45	54.54	3.704	4.444
4	25.49	45.50	8.80	43.97	56.02	3.788	4.826
5	25.06	44.74	6.97	43.98	56.01	2.808	3.576
6	23.76	39.29	9.41	39.51	60.48	3.862	5.912
7	25.94	45.15	9.33	42.54	57.45	3.903	5.270
8	24.22	42.72	9.31	43.30	56.69	3.928	5.143

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued							
TX 9	28.17	49.68	5.72	43.29	56.70	2.655	3.478
10	26.56	44.96	9.94	40.91	59.08	3.871	5.590
11	26.84	47.13	7.60	43.04	56.95	3.288	4.350
12	27.02	43.94	7.82	38.50	61.49	3.065	4.894
14	31.41	53.70	9.27	41.50	58.49	3.374	4.756
15	31.51	52.10	9.16	39.51	60.48	3.463	5.300
16	24.81	46.08	11.69	46.15	53.84	4.664	5.440
17	24.19	40.43	9.72	40.16	59.83	3.585	5.341
20	21.48	39.30	12.93	45.33	54.66	4.747	5.725
21	23.69	40.91	11.33	42.08	57.91	4.390	6.042
22	23.44	42.19	10.54	44.44	55.55	4.203	5.254
24	23.56	39.25	10.72	39.97	60.02	4.030	6.052
25	26.38	45.20	10.42	41.63	58.36	4.151	5.819
26	26.52	41.84	10.78	36.61	63.38	3.526	6.105
27	22.91	40.53	10.15	43.47	56.52	4.161	5.409
28	27.58	44.92	10.39	38.59	61.40	3.600	5.727
30	23.20	39.88	10.92	41.82	58.17	4.404	6.126
31	26.02	47.17	10.82	44.83	55.16	4.528	5.571
33	26.11	40.89	11.20	36.13	63.86	4.386	7.753
34	24.68	40.96	10.44	39.73	60.26	4.340	6.582
35	29.56	50.05	12.32	40.93	59.06	4.637	6.692
36	25.44	44.94	11.32	43.38	56.61	4.864	6.346
37	21.27	38.95	12.23	45.38	54.61	5.213	6.274
38	25.80	47.73	11.81	45.94	54.05	4.634	5.451
39	27.29	45.87	11.07	40.49	59.50	4.557	6.697
40	25.18	44.25	10.79	43.08	56.91	4.240	5.600
43	23.34	39.92	14.19	41.52	58.47	5.353	7.538
44	29.79	49.79	9.72	40.16	59.83	3.203	4.771
45	29.12	45.50	11.63	35.99	64.00	4.291	7.631
48	20.97	41.72	10.28	49.73	50.26	4.171	4.216
50	22.04	37.19	10.43	40.73	59.26	4.190	6.095
53	25.85	47.08	10.23	45.08	54.91	3.959	4.822
55	26.25	45.79	8.43	42.66	57.33	3.219	4.325
56	28.17	46.50	10.53	39.41	60.58	4.163	6.400
57	27.16	45.15	12.00	39.83	60.16	4.391	6.632
58	26.19	43.70	10.42	40.06	59.93	4.387	6.563
59	25.51	41.63	10.87	38.71	61.28	3.815	6.040
60	25.10	46.22	9.85	45.68	54.31	4.122	4.900
61	24.22	41.59	12.54	41.76	58.23	5.040	7.027
62	23.14	41.39	11.28	44.08	55.91	4.542	5.761
63	25.78	44.73	12.44	42.35	57.64	4.931	6.711
64	24.24	40.11	10.18	39.56	60.43	3.867	5.906
65	23.71	39.47	10.00	39.92	60.07	3.400	5.116
66	24.11	40.96	9.52	41.13	58.86	3.639	5.208
67	26.29	41.60	10.35	36.79	63.20	3.505	6.020
68	25.28	41.11	10.03	38.50	61.49	4.038	6.449
69	25.73	44.83	8.53	42.59	57.40	3.125	4.211
70	26.02	42.48	9.88	38.74	61.25	3.546	5.605
70A	25.20	39.33	9.92	35.92	64.07	4.148	7.399
71	24.16	40.34	9.88	40.10	59.89	3.877	5.790
72	22.74	41.89	10.24	45.70	54.29	4.260	5.061
73	26.71	50.35	8.66	46.94	53.05	4.000	4.520
74	24.47	40.97	11.29	40.27	59.72	4.542	6.736

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued							
TX 75	24.94	41.60	8.79	40.04	59.95	3.403	5.096
76	25.66	46.28	8.85	44.55	55.44	3.041	3.785
77	25.13	41.35	8.34	39.22	60.77	3.200	4.959
78	26.38	47.50	8.56	44.45	55.54	3.649	4.559
79	26.51	45.21	9.95	41.35	58.64	4.286	6.078
80	28.11	47.32	8.23	40.58	59.41	3.117	4.563
82	28.74	52.16	9.98	44.89	55.10	4.235	5.198
83	24.74	47.58	10.73	47.99	52.00	4.246	4.600
84	24.50	41.53	9.86	41.00	58.99	3.887	5.592
86	24.73	66.81	10.73	63.01	36.98	1.808	1.061
87	25.07	40.47	11.91	38.05	61.94	4.119	6.705
88	27.01	49.30	10.50	45.20	54.79	4.578	5.549
89	24.36	39.99	9.97	39.07	60.92	3.594	5.603
90	24.97	43.15	10.53	42.13	57.86	4.579	6.289
91	26.26	43.12	9.48	39.09	60.90	3.493	5.441
93	26.46	44.93	10.44	41.10	58.89	4.134	5.922
94	24.02	43.16	6.76	44.34	55.65	2.869	3.601
95	27.89	54.06	7.06	48.40	51.59	3.338	3.558
96	26.80	46.39	10.43	42.22	57.77	4.200	5.746
97	26.80	46.11	8.76	41.87	58.12	3.648	5.064
98	27.31	46.19	9.94	40.88	59.11	3.842	5.556
99	22.23	43.42	8.54	48.80	51.19	3.861	4.050
100	22.80	44.23	8.68	48.45	51.54	3.764	4.004
101	25.12	42.66	9.21	41.11	58.88	3.579	5.126
102	24.30	41.06	7.99	40.82	59.17	3.140	4.552
103	25.00	47.92	8.75	47.83	52.16	4.050	4.417
105	28.42	46.17	7.14	38.44	61.55	2.400	3.842
106	26.66	43.98	8.97	39.38	60.61	3.488	5.368
108	29.00	47.20	10.26	38.56	61.43	3.892	6.200
109	28.52	49.36	10.74	42.21	57.78	4.528	6.197
110	27.02	46.22	10.27	41.53	58.46	4.096	5.766
111	25.62	48.04	6.52	46.66	53.33	2.598	2.969
112	27.81	43.13	11.11	35.51	64.48	3.796	6.892
113	24.92	46.38	8.39	46.26	53.73	3.694	4.290
114	25.15	45.70	5.08	44.96	55.03	2.394	2.930
115	25.81	47.89	5.03	46.00	53.89	2.295	2.683
116	27.27	53.05	6.47	48.59	51.40	2.958	3.129
117	24.87	43.33	11.49	42.60	57.39	4.981	6.710
118	27.67	50.68	7.06	45.40	54.59	3.081	3.705
119	24.62	36.89	8.12	33.26	66.73	2.862	5.741
119A	23.45	44.24	5.35	46.98	53.01	2.287	2.581
120	26.43	44.77	8.62	40.95	59.04	3.146	4.535
121	27.08	44.05	9.24	38.51	61.48	3.464	5.530
122	25.39	49.77	9.69	48.98	51.01	4.432	4.615
123	26.25	42.98	9.19	38.91	61.08	3.760	5.903
124	26.72	50.68	10.05	47.27	52.72	4.022	4.485
125	26.88	46.25	7.70	41.87	58.12	3.139	4.357
126	26.63	45.76	9.36	41.80	58.19	3.618	5.037
127	25.99	48.79	7.00	46.72	53.27	2.993	3.412
128	26.40	47.41	6.28	44.30	55.69	2.530	3.180
129	28.03	47.85	5.59	41.41	58.58	2.126	3.008
130	25.78	43.69	7.08	40.98	59.01	2.950	4.248
131	26.87	49.11	5.35	45.28	54.71	2.554	3.086

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 132	25.86	49.52	7.73	47.77	52.22	3.484	3.809
133	25.99	44.51	6.47	41.60	58.39	2.666	3.742
134	26.51	47.92	6.94	44.67	55.32	2.832	3.507
138	28.96	51.88	5.58	44.17	55.82	2.348	2.967
139	26.50	48.84	6.03	45.73	54.26	2.645	3.138
140	28.61	49.23	9.37	41.88	58.11	3.593	4.985
141	24.32	42.16	7.37	42.30	57.69	3.153	4.300
142	25.40	43.20	8.47	41.20	58.79	3.345	4.772
143	24.69	45.81	7.74	46.09	53.90	3.492	4.084
144	25.12	43.89	4.93	42.76	57.23	2.127	2.847
145	25.48	49.21	5.29	48.21	51.78	2.514	2.700
146	27.05	46.42	8.97	41.72	58.27	3.835	5.357
148	27.32	47.08	6.44	41.96	58.03	2.660	3.679
149	23.43	40.83	12.15	42.60	57.39	4.716	6.352
150	27.98	48.24	7.37	41.99	58.00	2.962	4.092
151	25.18	45.57	8.75	44.76	55.26	3.842	4.740
152	23.88	41.05	7.98	41.82	58.17	3.421	4.758
153	22.74	46.31	9.22	50.89	49.10	4.608	4.446
154	23.36	41.65	8.26	43.91	56.08	3.493	4.461
155	24.51	54.78	10.52	55.25	55.25	4.673	3.784
156	25.65	45.06	10.80	43.07	56.92	4.443	5.872
157	25.48	50.23	9.71	49.26	50.73	4.596	4.733
158	26.02	46.99	8.47	44.62	55.37	3.845	4.772
159	27.72	51.00	6.34	45.65	54.35	2.645	3.148
160	26.17	42.45	9.62	38.34	61.65	3.694	5.940
161	26.43	45.27	8.54	41.61	58.38	3.583	5.026
162	27.90	45.73	9.27	38.98	61.01	3.483	5.451
163	26.00	45.35	10.09	42.66	57.33	3.993	5.365
164	25.78	50.15	8.59	44.56	55.43	3.589	4.465
165	24.03	44.50	5.30	46.00	53.99	2.334	2.739
167	25.99	42.88	9.67	39.38	60.61	3.941	6.065
168	25.92	46.58	9.58	44.34	55.65	3.868	4.854
169	27.27	46.03	10.07	40.75	59.24	3.855	5.605
170	26.98	54.56	8.08	50.54	49.45	4.157	4.067
171	26.59	46.15	9.40	42.37	57.62	3.771	5.129
172	26.56	48.41	7.80	45.13	54.86	3.432	4.172
173	28.05	47.29	6.89	40.68	59.31	2.773	4.042
174	28.41	58.84	6.82	51.71	48.28	3.463	3.233
175	27.07	45.55	9.97	40.56	59.43	3.905	5.722
176	24.23	47.25	8.51	48.71	51.28	4.317	4.544
177	23.73	47.62	8.78	50.16	49.83	4.208	4.180
178	27.63	46.75	10.00	40.89	59.10	3.632	5.249
179	29.60	50.25	9.65	41.08	58.91	3.724	5.341
180	26.52	46.36	11.67	42.78	57.21	4.680	6.259
181	27.89	46.72	6.64	40.29	59.70	2.609	3.865
182	28.73	49.84	9.20	42.34	57.65	3.640	4.957
183	26.62	47.42	11.04	43.85	56.14	4.694	6.009
184	22.01	41.12	4.78	46.46	53.53	2.094	2.413
185	25.84	43.73	8.69	40.90	59.09	3.383	4.888
186	25.93	49.59	7.52	47.70	52.29	3.522	3.861
187	24.75	44.35	7.20	44.19	55.80	2.880	3.636
188	27.69	47.82	7.70	42.09	57.90	3.007	4.137
189	28.31	53.90	7.00	47.47	52.52	3.106	3.436

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 190	26.44	51.92	7.50	49.07	50.92	3.355	3.481
191	29.10	61.04	7.57	52.32	47.67	3.500	3.189
192	29.09	48.46	7.43	39.96	60.03	2.828	4.248
194	28.57	51.15	7.68	44.13	55.86	3.327	4.212
195	26.67	46.43	9.22	42.48	57.51	4.183	5.662
196	23.19	45.88	9.12	49.44	50.55	4.159	4.252
197	23.68	41.86	8.96	43.43	56.56	3.654	4.758
198	27.63	47.96	10.22	42.38	57.61	4.305	5.851
199	27.81	45.60	9.17	39.01	60.98	3.642	5.694
200	27.30	48.20	9.00	43.36	56.63	3.606	4.709
201	23.90	42.69	10.84	44.01	55.98	4.462	5.675
202	24.70	45.11	6.86	45.23	54.76	2.971	3.597
203	26.54	44.30	10.18	40.08	59.91	4.200	6.278
204	27.41	44.51	9.54	38.41	61.58	3.825	6.131
205	26.97	48.52	9.23	44.40	55.59	3.386	4.240
206	27.31	44.66	10.94	38.84	61.15	4.007	6.308
207	25.56	45.63	7.48	43.97	56.02	3.032	3.863
208	25.31	45.61	7.20	44.50	55.49	3.048	3.800
209	25.94	42.94	9.81	39.58	60.41	3.716	5.671
210	28.08	49.92	8.21	43.74	56.25	3.652	4.697
212	27.01	48.11	5.86	43.85	56.14	2.395	3.066
213	27.30	52.10	6.52	47.59	52.40	2.900	3.193
214	24.19	42.31	7.79	42.82	57.17	3.296	4.400
215	26.17	46.56	9.00	43.78	56.21	3.988	5.121
216	23.93	42.77	8.39	55.95	44.04	3.583	4.551
217	26.19	43.31	8.34	39.52	60.47	3.296	5.043
218	27.62	51.47	10.03	46.33	53.66	4.271	4.947
219	27.11	47.13	8.82	42.47	57.52	3.329	4.508
220	26.01	40.95	10.13	36.47	63.52	3.565	6.208
221	27.02	46.30	9.36	41.63	58.36	3.947	5.534
222	25.61	41.49	10.36	38.26	61.73	4.115	6.639
223	25.00	43.49	8.86	42.51	57.48	3.575	4.833
224	25.62	44.49	11.47	42.40	57.59	4.818	6.544
225	26.03	44.04	10.61	40.89	59.00	4.211	6.086
226	26.78	44.19	10.23	39.39	60.60	3.738	5.751
227	27.51	49.47	6.74	55.61	44.38	2.878	3.606
228	29.08	48.54	8.70	59.91	40.08	3.394	5.073
229	25.36	47.65	6.74	53.22	46.77	2.988	3.400
230	22.91	41.04	6.38	55.82	44.17	3.042	3.845
231	25.67	54.66	5.17	53.03	46.96	2.464	2.182
232	26.30	49.58	5.89	46.95	53.05	2.641	2.984
233	25.75	48.48	7.04	46.88	53.11	3.058	3.465
234	25.73	43.22	9.92	40.46	59.53	3.868	5.868
235	25.82	45.57	9.53	43.33	56.66	4.124	5.393
235A	26.65	45.68	6.88	41.65	58.34	2.777	3.889
236	27.65	46.81	10.22	40.92	59.07	4.288	6.189
238	24.89	43.22	7.86	42.40	57.59	3.258	4.425
239	26.40	43.21	9.72	38.89	61.10	3.613	5.676
240	25.66	44.99	8.11	42.95	57.04	3.343	4.439
242	26.17	44.71	11.05	41.46	58.53	3.947	5.571
243	28.34	46.83	9.49	39.47	60.52	3.722	5.707
244	27.05	43.32	10.80	37.55	62.44	3.988	6.631
245	24.00	40.14	9.67	40.20	59.79	3.432	5.105
246	28.72	52.58	7.75	45.37	54.62	3.084	3.713
247	26.79	46.13	9.20	41.92	58.07	3.455	4.786
248	25.65	42.96	8.64	40.29	59.70	3.552	5.264
249	25.79	41.36	8.65	37.63	62.36	3.211	5.322

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 250	25.54	43.87	7.99	41.77	58.22	3.185	4.440
251	26.68	45.84	6.00	41.79	58.20	2.478	3.451
251A	25.95	45.19	5.65	42.57	57.42	2.413	3.254
252	25.82	46.04	6.23	43.91	56.08	2.758	3.522
253	27.19	47.30	6.33	42.51	57.48	2.683	3.628
254	25.89	49.65	6.34	47.84	52.15	2.959	3.225
256	28.24	46.30	8.00	38.99	61.00	4.000	6.258
257	30.76	49.85	8.22	38.28	61.71	2.748	4.430
258	29.20	52.98	7.94	44.88	55.11	3.472	4.264
259	25.91	48.58	7.03	46.66	53.33	3.325	3.800
260	27.72	50.35	7.97	44.93	55.06	3.246	3.977
261	26.48	50.22	5.88	47.26	52.73	2.467	2.752
263	24.92	44.20	6.89	43.61	56.38	2.839	3.670
264	26.54	47.67	5.72	44.31	55.68	2.428	3.051
265	27.55	47.61	6.63	42.13	57.86	2.754	3.782
266	16.67	27.69	6.28	56.33	43.66	3.177	2.462
268	26.04	50.15	6.01	48.07	51.92	2.666	2.879
271	25.79	42.73	6.16	39.64	60.35	2.445	3.722
272	29.12	49.84	6.67	41.56	58.43	2.595	3.648
273	28.77	58.49	5.14	50.80	49.19	2.290	2.217
275	25.96	50.68	6.42	48.77	51.22	2.770	2.909
276	26.39	53.52	5.79	50.68	49.31	2.478	2.411
277	25.94	89.69	7.07	47.79	52.20	3.265	3.566
278	26.81	88.37	7.48	44.56	55.43	3.238	4.028
280	25.28	47.25	8.28	46.49	53.50	3.600	4.143
281	28.72	55.39	5.96	48.14	51.85	2.843	3.062
283	28.45	60.22	5.52	52.75	47.24	2.288	2.049
284	26.00	52.50	6.20	50.47	49.52	3.034	2.977
285	26.77	51.74	5.81	48.25	51.74	2.415	2.590
289	28.99	46.92	5.75	38.20	61.79	2.102	3.400
290	26.94	46.22	7.04	41.70	58.29	2.859	3.996
292	30.03	50.92	7.26	41.01	58.98	2.788	4.010
293	26.21	45.22	7.97	42.03	57.96	3.343	4.610
294	24.36	43.08	10.54	43.44	56.55	4.747	6.179
295	29.35	51.28	6.35	42.76	57.23	2.496	3.341
296	27.08	45.13	6.35	40.00	59.99	2.559	3.838
297	27.41	47.31	7.80	42.05	57.94	2.876	3.963
301	28.79	48.44	8.28	40.55	59.44	3.031	4.443
302	26.07	49.84	6.11	47.68	52.31	2.578	2.828
303	26.03	51.21	6.49	49.16	50.83	2.750	2.843
304	25.61	49.65	6.61	48.41	51.58	3.079	3.280
306	26.76	54.80	6.60	51.16	48.83	2.856	2.726
307	26.63	48.59	6.55	45.19	54.80	2.964	3.594
308	25.35	44.92	6.60	43.56	56.43	2.738	3.547
309	24.04	50.55	6.37	52.43	47.56	2.990	2.712
310	26.51	48.24	6.85	45.03	54.96	2.706	3.302
312	27.29	51.23	6.23	46.72	53.27	2.800	3.192
313	26.07	51.27	6.08	49.14	50.85	2.762	2.858
314	26.20	52.70	6.26	50.36	49.63	2.777	3.747
316	25.54	52.33	6.43	51.18	48.81	2.878	2.745
318	26.58	48.69	6.37	45.40	54.59	2.674	3.215
320	26.83	51.29	6.25	47.68	52.31	2.830	3.105
321	26.15	52.99	6.50	50.64	49.35	3.032	2.955
322	25.40	46.87	6.49	45.80	54.19	2.867	3.392
323	25.55	51.97	6.27	50.83	49.16	2.952	2.855
324	25.85	48.88	6.29	47.11	52.88	2.789	3.130
325	24.09	58.34	5.83	50.16	49.83	2.714	2.696

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 326	26.59	51.22	5.85	48.08	51.91	2.605	2.812
327	26.03	48.44	6.12	46.25	53.74	2.671	3.104
328	27.32	48.05	6.16	43.13	56.86	2.500	3.296
329	27.07	49.25	6.52	45.02	54.97	2.495	3.046
330	25.75	46.30	6.40	44.37	55.62	2.700	3.385
332	25.33	46.68	6.15	45.73	54.26	2.817	3.343
334	26.48	46.05	6.38	42.50	57.50	2.533	3.427
336	25.67	46.36	6.70	44.62	55.37	2.76	3.321
337	24.79	46.83	6.31	47.05	52.94	2.700	3.038
339	25.22	48.79	6.37	48.30	51.69	2.662	2.849
340	25.53	45.85	6.08	44.31	55.68	2.668	3.352
341	25.33	49.02	5.82	48.32	51.67	2.607	2.788
342	27.58	49.47	6.63	44.24	55.75	2.857	3.600
344	26.10	52.56	6.26	50.33	49.66	2.897	2.859
345	26.04	49.77	6.12	47.67	52.32	2.918	3.203
346	24.30	42.61	6.94	42.96	57.03	2.763	3.668
347	25.58	46.90	7.35	45.45	54.54	4.013	4.815
367	21.92	48.35	4.23	54.65	45.34	2.049	1.700
371	21.67	39.81	3.72	45.56	54.43	1.669	1.994
373	25.76	43.85	8.60	41.24	58.75	3.651	5.200
375	26.26	42.27	10.28	37.86	62.13	3.665	6.015
377	26.61	48.15	5.80	44.72	55.27	2.558	3.161
378	27.23	52.37	6.17	47.99	52.00	2.697	2.992
379	22.71	43.77	5.54	48.10	51.89	2.223	2.398
390	21.95	47.32	4.82	53.60	46.39	1.993	1.725
396	26.75	45.70	8.00	41.46	58.53	3.297	4.655
397	25.75	48.74	8.41	47.16	52.83	3.831	4.292
399	28.76	49.46	7.77	41.84	58.15	2.855	3.967
400	27.10	49.56	7.60	45.31	54.68	3.185	3.844
401	22.54	37.00	8.95	39.07	60.92	3.481	5.427
404	25.39	45.13	9.42	43.73	56.26	4.050	5.211
406	24.37	43.89	7.80	44.47	55.52	3.282	4.098
408	27.94	47.21	6.39	40.81	59.18	2.546	3.692
409	26.68	45.28	7.88	41.07	58.92	3.021	4.334
458	24.66	48.80	5.16	49.46	50.53	2.279	2.328
459	25.05	51.32	5.41	51.18	48.81	2.513	2.397
460	30.49	53.16	9.45	42.64	57.35	4.003	5.383
461	27.89	50.73	6.42	45.01	54.98	2.743	3.350
462	31.09	48.46	6.65	35.83	64.16	2.326	4.164
463	29.60	49.92	8.21	40.69	59.30	3.194	4.654
464	28.08	49.03	10.72	42.72	57.27	4.498	4.031
465	28.25	44.63	11.75	36.69	63.30	3.932	6.782
466	29.29	47.95	8.33	38.90	61.09	3.235	5.080
467	27.25	47.19	9.29	42.24	57.75	3.960	5.414
469	24.86	49.78	9.72	50.05	49.94	4.391	4.381
475	24.55	50.77	5.47	51.63	48.36	2.684	2.514
477	24.39	54.74	5.08	55.43	44.56	2.728	2.193
478	22.77	42.55	5.69	46.48	53.51	2.543	2.928
479	25.54	47.76	9.20	46.51	53.48	4.115	4.731
481	26.55	48.33	5.44	45.05	54.94	2.368	2.888
487	23.99	48.82	5.15	50.85	49.14	2.548	2.462
488	25.67	44.28	7.07	42.02	57.97	3.037	4.190
489	24.68	55.56	6.01	55.57	44.42	2.681	2.143
490	23.70	43.42	4.88	45.41	54.58	2.111	2.537
492	25.05	44.95	5.43	44.26	55.73	2.235	2.814
495	22.76	52.73	4.59	56.83	43.16	2.234	1.697
495A	22.76	47.43	5.27	52.00	47.99	2.422	1.235

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 497	23.22	47.94	4.73	51.55	48.44	2.200	2.067
498	22.69	43.38	9.66	47.69	52.30	4.982	5.463
499	20.90	41.48	6.62	49.71	50.38	2.703	2.734
500	28.04	46.07	10.97	39.13	60.86	4.238	6.590
502	27.05	44.22	10.27	38.82	61.17	3.720	5.862
570	25.02	42.86	11.65	41.62	58.37	4.885	6.850
595	22.44	43.85	8.05	48.78	51.21	3.533	3.709
596	23.27	40.79	9.85	42.94	57.05	3.896	5.176
597	24.21	40.14	9.83	39.67	60.32	3.929	5.973
600	24.44	45.89	6.11	46.73	53.26	2.409	2.746
604	29.55	48.44	7.17	38.99	61.00	2.831	4.428
605	26.28	48.94	8.31	46.29	53.70	3.646	4.229
606	23.89	47.48	7.32	49.67	50.32	3.269	3.312
607	26.82	48.45	8.68	44.63	55.36	3.588	4.450
609	26.58	45.13	7.58	41.10	58.89	2.800	4.012
610	25.20	42.20	8.16	40.28	59.71	3.473	5.148
611	25.01	44.56	9.75	43.86	56.13	4.300	5.503
612	23.39	43.31	8.36	45.98	54.01	3.639	4.275
615	26.04	47.59	9.10	45.27	54.72	4.260	5.149
616	22.24	38.73	12.13	42.57	57.42	5.306	7.156
619	23.88	42.28	10.62	43.51	56.48	4.625	6.004
620	23.91	44.38	10.01	46.12	53.87	4.550	5.315
621	27.61	49.85	7.50	44.60	55.39	3.006	3.733
622	24.63	41.16	10.00	40.15	59.84	3.602	5.369
623	24.76	46.96	11.40	47.26	52.73	5.160	5.758
624	13.85	31.66	7.94	56.25	43.74	5.108	3.972
625	25.20	47.57	9.23	47.02	52.97	4.041	4.553
627	26.36	46.14	7.77	42.85	57.13	3.241	4.322
628	23.19	45.98	6.94	49.55	50.44	3.085	3.141
633	23.02	38.00	10.07	39.41	60.58	3.938	6.053
634	24.55	47.44	8.62	48.24	51.75	41.50	4.452
635	23.96	49.75	8.38	51.83	48.16	3.930	3.652
636	24.92	45.93	8.23	45.73	54.26	3.916	4.647
637	24.04	46.48	7.39	48.27	51.72	3.453	3.700
638	25.94	46.10	8.90	43.72	56.27	3.767	4.848
639	27.60	45.60	10.09	39.41	60.58	4.195	6.449
640	27.39	44.95	10.56	39.05	60.94	4.141	6.462
641	18.82	37.06	7.04	49.21	50.78	3.400	3.509
642	18.29	38.12	7.59	52.01	47.98	4.085	3.768
643	23.73	39.30	9.30	39.50	60.49	3.775	5.781
644	24.56	41.40	11.20	40.66	59.33	4.246	6.195
645	25.12	42.47	9.17	42.47	59.15	3.675	5.322
646	25.62	44.21	9.08	44.21	57.95	3.992	5.502
647	26.55	44.32	8.83	44.32	59.91	3.163	4.727
649	25.58	46.57	8.31	46.57	54.93	3.484	4.247
650	26.31	47.18	10.03	47.18	55.77	4.146	5.228
655	25.79	47.64	5.22	47.64	54.14	2.239	2.644
657	25.27	47.00	5.92	46.23	53.76	2.522	2.933
658	24.21	46.45	5.97	47.87	52.12	2.755	3.000
662	24.59	50.36	5.54	51.16	48.83	2.646	2.525
663	26.13	52.82	5.76	50.52	49.47	2.587	2.533
664	25.07	47.24	6.15	46.92	53.07	2.468	2.791
665	26.03	49.08	5.29	46.15	53.84	2.489	2.904
668	24.44	50.94	4.82	52.01	47.98	2.171	2.003
670	19.79	37.52	4.36	47.25	52.74	1.865	2.082
672	25.43	50.42	4.65	49.55	50.44	2.048	2.085
674	27.23	48.97	10.47	44.38	55.61	4.465	5.595

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 675	28.60	48.57	6.52	41.11	58.88	2.644	3.786
677	26.60	59.84	9.00	55.54	44.45	4.240	3.393
678	25.60	47.60	5.68	46.27	53.78	2.439	2.838
679	25.61	45.38	8.75	43.55	56.44	3.211	4.161
680	25.73	50.37	5.79	48.91	51.08	2.445	2.553
681	25.27	43.00	11.86	41.21	58.78	4.743	6.776
682	28.02	45.16	10.04	37.95	62.04	3.911	6.393
683	26.68	44.93	10.22	40.61	59.38	4.043	5.912
684	27.17	47.38	10.42	42.65	57.34	3.616	4.862
685	26.80	45.95	9.76	41.66	58.33	3.785	5.299
686	26.50	54.77	5.49	51.61	48.38	2.546	2.387
687	25.97	46.12	5.24	46.38	53.61	2.311	2.671
688	21.93	41.96	4.84	47.42	52.27	2.217	2.428
690	26.54	48.72	9.13	45.52	54.47	3.690	4.415
691	23.90	45.21	6.51	47.12	52.87	2.735	3.069
693	24.87	47.37	4.98	47.49	52.50	2.200	2.432
697	28.28	47.51	6.07	40.46	59.53	2.447	3.600
698	22.48	45.10	5.10	50.15	49.84	2.253	2.239
700	26.47	47.11	6.30	43.80	56.19	2.440	3.130
701	26.35	48.92	6.41	46.13	53.86	2.700	3.152
702	28.03	45.60	11.96	38.52	61.47	4.381	6.990
704	25.88	44.25	9.41	41.51	58.48	3.682	5.188
705	23.39	52.08	5.89	55.08	44.91	2.840	2.316
707	27.02	44.82	9.69	39.71	60.28	3.555	5.397
708	24.48	47.72	4.44	48.69	51.30	1.846	1.945
709	27.28	48.00	11.37	43.16	56.83	4.286	5.644
710	23.32	39.13	5.87	40.40	59.59	2.269	3.347
711	26.39	48.07	9.70	45.09	54.90	4.200	5.113
712	22.84	45.89	4.43	50.22	49.77	1.792	1.776
713	22.05	51.62	4.70	57.27	42.72	2.200	1.641
714	22.81	47.00	5.37	51.46	48.53	2.330	2.197
717	27.66	55.81	9.66	50.43	49.56	4.594	4.515
720	24.92	46.71	8.12	46.64	53.35	3.644	4.169
724	26.25	45.42	6.20	42.20	57.79	2.283	3.126
725	23.64	47.44	5.36	50.16	49.83	2.677	2.659
728	30.98	51.22	8.08	39.50	60.49	3.129	4.791
730	27.70	48.90	7.19	43.34	56.65	2.928	3.827
731	26.83	51.80	6.00	48.19	51.80	2.691	2.892
732	29.64	55.04	8.55	46.14	53.85	3.220	3.758
733	25.51	47.67	5.74	46.48	53.51	2.647	3.047
734	26.22	50.67	5.19	48.24	51.75	2.253	2.417
735	28.09	48.94	6.87	42.59	57.40	2.468	3.326
737	26.75	47.85	7.01	44.09	55.90	2.839	3.600
738	27.31	45.85	11.32	40.43	59.56	4.118	6.065
739	25.50	48.20	6.13	47.08	52.91	2.705	3.040
740	29.56	56.56	6.64	47.73	52.26	2.875	3.148
741	26.42	51.63	6.03	48.82	51.17	2.551	2.674
742	26.59	50.53	6.01	47.37	52.62	2.551	2.834
743	27.07	47.14	9.66	42.56	57.43	3.900	5.262
744	27.21	58.74	5.51	53.67	46.32	2.607	2.250
745	25.05	62.70	5.29	60.04	39.95	2.636	1.754
746	31.07	49.42	7.33	37.12	62.87	2.617	4.432
748	28.00	51.85	7.30	45.80	54.19	3.064	3.625
749	24.92	50.53	7.54	50.67	49.32	3.220	3.134
750	26.68	46.44	8.87	42.54	57.45	3.443	4.650
751	30.19	47.78	6.83	36.81	63.18	2.249	3.860
752	31.36	51.96	5.65	37.62	60.37	2.100	3.200

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 754	28.42	45.28	7.19	37.37	62.77	2.469	4.147
755	26.96	48.38	10.64	44.27	55.72	4.318	5.435
756	27.13	45.23	9.38	40.01	59.98	3.200	4.798
757	24.04	45.50	4.86	47.16	52.83	2.022	2.265
758	23.21	47.28	4.59	50.90	49.09	2.281	2.200
760	23.28	40.57	7.14	43.61	56.38	2.954	3.819
761	23.58	54.68	4.93	56.87	43.12	2.774	2.103
763	26.74	46.25	7.62	42.17	57.82	3.041	4.169
764	25.75	47.54	7.46	45.83	54.16	3.238	3.826
765	25.89	53.06	5.17	51.20	48.79	2.408	2.295
766	24.44	46.59	5.68	47.53	52.46	2.580	2.848
767	25.85	45.95	5.46	43.73	56.26	2.431	3.128
770	25.71	42.21	9.12	39.08	60.91	3.547	5.528
771	28.25	46.57	9.84	39.33	60.66	3.688	5.689
773	29.05	56.11	10.51	48.22	51.77	4.593	4.931
776	24.55	50.51	6.52	51.39	48.60	3.319	3.139
783	24.77	50.87	7.37	51.30	48.69	3.327	3.158
784	23.59	47.74	7.95	50.58	49.41	3.583	3.500
785	23.70	46.27	7.89	48.77	51.22	3.847	4.041
786	27.13	54.23	6.86	49.96	50.03	3.195	3.200
787	27.32	58.53	5.34	53.31	46.68	2.414	2.114
788	25.96	46.76	6.37	44.47	55.52	2.771	3.459
789	24.77	49.25	5.59	49.70	50.29	2.750	2.783
790	23.21	47.78	5.13	51.41	48.58	2.442	2.308
791	22.50	49.39	5.64	54.43	45.56	3.160	2.645
792	26.80	60.66	5.58	55.81	44.18	2.884	2.283
793	25.59	45.72	5.47	44.02	55.97	2.291	2.913
794	23.19	54.84	5.73	42.29	57.70	2.983	2.186
795	24.41	47.56	6.03	48.66	51.33	2.795	2.948
799	20.08	48.56	4.44	58.64	41.35	2.269	1.600
802	24.59	52.98	6.42	53.58	46.41	3.126	2.708
805	26.93	49.60	6.95	45.69	54.30	3.107	3.693
806	24.76	45.31	7.11	45.34	54.65	3.129	3.771
807	24.13	45.42	7.46	46.86	53.13	3.245	3.679
808	26.50	49.12	6.41	46.04	53.95	2.639	3.092
809	26.72	46.67	6.35	42.74	57.25	2.441	3.270
810	25.44	50.56	7.86	49.67	50.32	3.642	3.689
811	27.57	45.77	6.67	39.76	60.23	2.414	3.656
812	26.18	46.22	6.07	43.35	56.64	2.285	2.985
813	25.10	44.87	6.03	44.05	55.94	2.403	3.051
814	26.27	48.57	5.92	45.90	54.09	2.676	3.153
815	29.29	57.51	6.40	49.06	50.93	2.747	2.852
834	22.97	46.05	6.05	50.11	49.88	2.818	2.805
931	27.72	43.77	9.92	36.66	63.33	3.673	6.345
932	26.39	43.02	9.56	38.65	61.34	3.417	5.423
933	26.88	42.66	9.00	36.98	63.01	3.424	5.834
939	23.87	47.57	4.44	49.81	50.18	2.002	2.017
948	25.72	46.48	6.79	44.66	55.33	3.134	3.882
957	19.77	38.26	5.13	48.32	51.67	2.481	2.653
959	25.89	48.79	6.71	46.93	53.06	3.124	3.532
960	26.56	48.70	6.83	45.45	54.54	2.981	3.577
984	28.13	46.86	11.52	39.96	60.03	4.300	6.460
986	26.50	47.18	6.84	43.82	56.17	2.697	3.457
996	25.30	44.20	7.25	42.76	57.23	2.863	3.832
1001	26.71	58.74	6.48	54.52	45.47	3.546	2.957
1003	28.27	45.41	10.13	37.73	62.26	3.758	6.200
1004	26.35	44.23	9.50	40.42	59.57	3.772	5.560

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 1004A	26.14	44.72	9.04	41.54	58.45	3.664	5.156
1005	27.12	48.26	8.16	43.80	56.19	3.360	4.311
1009	23.39	44.26	5.71	47.14	52.85	2.448	2.744
1010	25.88	44.44	9.54	41.76	58.23	3.858	5.379
1015	27.21	44.47	6.76	38.80	61.19	2.645	4.171
1021	22.81	43.98	4.62	48.13	51.86	1.693	1.824
1028	22.11	39.50	10.45	44.02	55.97	4.393	5.586
1029	28.37	45.20	9.85	37.22	62.77	3.390	5.718
1032	27.15	44.93	8.69	39.56	60.43	3.200	4.800
1036	27.93	53.63	5.46	47.91	52.08	2.272	2.470
1040	23.26	45.26	5.27	48.60	51.39	2.346	2.481
1041	23.98	49.74	4.94	51.78	48.21	2.159	2.010
1042	26.45	47.95	5.87	44.83	55.16	2.557	3.146
1043	24.87	49.32	4.26	49.56	50.43	2.044	2.080
1045	25.68	47.19	6.94	45.57	54.42	2.974	3.552
1046	29.41	50.43	6.18	41.67	58.32	2.431	3.402
1050	25.00	52.87	5.16	52.70	47.29	2.383	2.138
1053	29.44	54.56	7.63	46.03	53.96	3.216	3.770
1054	27.28	44.88	9.57	39.21	60.78	3.290	5.100
1055	29.01	58.70	7.14	50.57	49.42	3.232	3.159
1056	27.42	56.99	5.64	51.88	48.11	2.604	2.415
1057	26.85	56.29	6.52	52.29	47.70	2.761	2.519
1061	25.44	52.50	5.78	51.43	48.46	2.753	2.589
1063	25.81	47.77	6.42	45.96	54.03	2.692	3.164
1064	26.90	52.26	6.11	48.52	51.47	2.662	2.824
1065	24.82	44.75	4.13	44.53	55.46	1.927	2.400
1066	25.70	50.77	3.93	49.37	50.62	1.741	1.785
1069	24.71	48.33	6.57	48.86	51.13	3.091	3.235
1076	23.25	43.08	5.25	46.02	53.97	2.322	2.723
1086	26.69	46.06	7.37	42.04	57.95	2.924	4.030
1092	31.47	53.59	9.40	41.27	58.72	3.678	5.233
1094	28.42	50.99	8.16	44.25	55.74	3.393	4.274
1099	28.54	49.15	9.12	41.92	58.07	3.611	5.002
1100	29.93	54.39	8.20	44.96	55.03	3.620	4.430
1101	25.33	44.74	10.28	43.38	56.61	4.167	5.438
1102	26.41	45.05	11.14	41.37	58.62	3.954	5.602
1103	28.72	46.64	11.22	38.41	61.58	4.477	7.178
1105	26.44	48.70	8.93	45.70	54.29	3.980	4.728
1106	26.10	46.86	6.43	44.29	55.70	2.831	3.560
1107	26.56	51.19	6.05	48.10	51.89	2.966	3.200
1108	23.16	48.65	5.30	52.38	47.61	2.636	2.396
1109	26.46	47.45	6.06	44.23	55.76	2.523	3.180
1111	25.72	47.06	5.77	45.34	54.65	2.550	3.074
1112	25.07	50.10	4.30	49.95	50.04	2.010	2.014
1114	27.74	51.16	8.06	45.77	54.22	3.702	4.386
1114A	26.53	43.56	7.80	39.09	60.90	2.836	4.419
1116	26.32	49.51	7.72	46.83	53.16	3.485	3.956
1117	27.04	51.21	8.31	47.19	52.80	3.966	4.437
1121	29.36	56.79	9.36	48.29	51.70	3.945	4.223
1122	26.18	43.16	8.44	39.33	60.66	3.400	5.243
1125	26.79	44.91	9.45	40.34	59.65	3.500	5.175
1126	25.81	44.85	11.34	42.44	57.55	4.300	5.830
1127	23.58	41.42	7.51	43.06	56.93	3.630	4.800
1130	22.97	43.70	7.40	47.43	52.56	3.388	3.754
1131	27.58	47.65	9.28	42.11	57.88	3.773	5.185
1134	25.61	48.27	6.50	46.93	53.06	2.662	3.010
1136	18.32	29.87	3.59	38.66	61.33	1.388	2.202

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1972-73 IGUALA SEED--Continued				
TX 1138	19.02	41.20	7.12	53.82	46.17	3.560	3.054
1139	29.47	51.13	6.32	42.35	57.64	2.521	3.431
1141	27.24	46.58	7.84	41.51	58.48	2.709	3.817
1142	29.94	50.07	9.27	40.20	59.79	3.402	5.060
1143	30.89	51.73	8.96	40.28	59.71	3.272	4.851
1144	31.49	49.85	9.08	36.82	63.17	3.151	5.406
1145	29.39	50.98	8.28	42.34	57.65	3.431	4.671
1147	27.35	44.02	10.63	37.86	62.13	4.030	6.614
1148	27.29	45.00	7.13	60.65	39.34	2.894	4.462
1149	27.73	47.41	8.52	41.50	58.49	3.517	4.957
1150	27.08	49.55	6.14	45.34	54.65	2.572	3.100
1151	26.52	45.03	10.26	41.10	58.89	4.275	6.125
1152	27.95	51.44	6.99	45.66	54.33	2.918	3.472
1154	24.33	42.49	6.93	42.73	57.26	2.869	3.845
1155	22.47	38.67	10.20	41.89	58.10	4.245	5.888
1156	27.51	45.78	6.38	39.90	60.09	2.011	3.028
1157	25.60	42.72	6.14	40.07	59.92	2.497	3.734
1158	26.61	43.70	7.71	39.10	60.89	2.692	4.192
1159	26.45	46.64	7.53	43.28	56.71	3.024	3.962
1160	26.53	42.58	7.07	37.69	62.30	2.441	4.035
1161	25.13	44.92	7.43	44.05	55.94	2.948	3.744
1162	25.23	45.25	7.60	44.23	55.76	3.037	3.828
1163	24.51	44.33	6.56	44.70	55.29	2.505	3.099
1164	26.62	44.72	7.51	40.47	59.52	2.797	4.113
1165	25.82	43.64	7.41	40.83	59.16	3.033	4.395
1166	25.02	42.61	7.95	41.27	58.72	2.990	4.254
1167	28.37	50.07	10.20	43.34	56.65	4.284	5.600
1168	30.03	50.22	9.38	40.19	59.80	3.572	5.315
1169	25.65	49.70	6.26	48.38	51.63	2.616	2.791
1170	25.82	45.39	4.95	43.11	56.88	2.135	2.817
1171	23.99	43.54	4.35	44.89	55.10	1.840	2.258
1174	23.97	45.34	5.72	47.12	52.87	2.512	2.819
1175	25.10	47.30	5.56	46.93	53.06	2.466	2.788
1176	24.59	47.64	5.41	48.37	51.62	2.535	2.705
1177	25.99	49.56	7.23	47.55	52.44	2.982	3.288
1178	21.06	42.87	4.65	50.87	49.12	2.118	2.045
1179	27.07	51.87	6.77	47.80	52.19	2.629	2.870
1180	26.22	53.44	5.61	50.93	49.06	2.277	2.193
1182	27.94	47.39	8.42	41.03	58.96	3.383	4.862
1183	28.23	47.25	7.73	40.24	59.75	3.004	4.460
1192	24.86	45.93	10.63	45.86	54.13	4.309	5.086
1194	23.96	41.80	10.67	42.67	57.32	4.295	5.770
1195	27.21	44.22	9.88	38.45	61.54	3.620	5.793
1196	26.16	43.47	10.94	39.81	60.18	4.115	6.221
1197	25.87	43.54	10.25	40.58	59.41	4.066	5.953
1200	26.13	46.30	11.04	43.55	56.44	4.381	5.677
1201	25.67	46.40	10.57	44.67	55.32	4.532	5.613
1210	26.73	45.09	11.58	40.71	59.28	4.464	6.500
1211	27.19	49.39	9.62	44.94	55.05	4.333	5.307
1212	27.82	45.85	11.64	39.31	60.68	4.082	6.300
1213	27.04	43.75	10.50	38.18	61.81	4.038	6.536
1215	26.36	45.70	9.37	42.31	57.68	3.947	5.381
1219	28.02	45.05	9.23	37.79	62.20	3.487	5.738
1231	25.77	43.76	6.80	41.10	58.89	2.584	3.702
1232	26.37	54.36	7.16	51.48	48.51	3.445	3.246
1233	26.91	45.47	8.72	40.81	59.18	3.595	5.212
1234	23.31	38.99	11.24	40.21	59.78	4.411	6.557

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1968-69 IGUALA SEED				
TX 11	20.10	33.97	8.13	40.82	59.17	3.063	4.439
38	25.96	45.70	10.82	43.18	56.81	3.970	5.224
50	21.80	38.03	9.79	42.66	57.33	4.754	6.389
59	25.30	42.74	10.29	40.79	59.20	4.096	5.945
69	26.15	40.86	9.94	35.99	64.00	3.437	6.111
87	25.60	43.03	10.93	40.50	59.49	4.254	6.248
104	20.96	44.55	7.15	52.94	47.05	3.358	2.984
124	20.26	36.18	7.28	43.99	56.00	2.909	3.703
128	24.89	42.37	8.03	41.24	58.75	3.230	4.602
145	24.63	42.38	5.56	41.87	58.12	2.350	3.262
147	25.71	45.73	6.82	43.77	56.22	2.448	3.144
254	20.61	34.52	7.34	40.29	59.70	2.945	4.363
278	23.98	43.25	8.19	44.54	55.45	3.294	4.100
408	28.08	46.38	7.20	39.45	60.54	2.665	4.089
409	24.78	41.06	7.48	39.64	60.35	2.973	4.526
			TEXAS COLLECTION, 1969-70 IGUALA SEED				
TX 11	26.56	47.74	7.74	44.36	55.63	3.229	4.050
19	26.81	43.40	11.42	38.22	61.77	4.173	6.743
29	22.65	42.40	9.40	46.57	53.42	3.745	4.296
32	23.18	43.74	7.31	46.99	53.00	3.260	3.677
68	22.95	38.55	9.26	40.45	59.54	3.357	4.942
71	21.42	38.39	9.33	44.20	55.79	4.096	5.169
74	23.26	38.67	10.46	39.84	60.15	4.058	6.127
87	25.44	39.41	11.64	35.43	64.56	3.687	6.719
105	25.42	41.84	9.20	39.23	60.76	3.493	5.410
110	26.19	41.72	10.15	37.21	62.78	3.551	5.991
115	25.58	47.04	5.28	45.61	54.38	2.236	2.666
165	23.95	41.91	5.89	42.85	57.14	2.258	3.011
184	21.06	41.46	5.50	49.19	50.80	2.253	2.327
187	24.43	46.20	5.84	47.10	52.89	2.623	2.945
188	25.29	39.89	8.14	36.59	63.40	2.430	4.210
207	22.75	41.53	8.79	45.21	54.78	3.781	8.362
230	22.82	49.53	6.83	53.92	46.07	2.926	2.500
231	24.39	45.99	5.23	46.96	53.03	2.328	2.629
252	24.74	44.45	6.86	44.33	55.66	2.741	3.442
265	24.64	44.78	6.51	44.96	55.03	2.727	3.338
271	23.90	42.45	6.57	43.69	56.30	2.608	3.361
284	19.63	37.09	5.82	47.06	52.93	3.033	3.411
295	26.78	48.30	7.15	44.54	55.45	2.758	3.433
297	27.66	46.74	8.09	40.81	59.18	3.191	4.627
311	24.80	44.18	7.19	43.85	56.14	2.887	3.696
328	24.31	40.82	8.86	40.44	59.55	3.321	4.890
331	25.00	42.21	6.52	40.76	59.23	2.600	3.778
333	25.74	45.56	6.95	43.49	56.50	2.586	3.359
334	23.73	44.93	6.40	47.17	52.82	2.606	5.524
335	26.31	44.20	6.88	40.46	59.53	2.469	3.633
346	22.70	40.29	6.44	43.65	56.34	2.695	3.479
399	28.60	48.09	7.97	40.52	59.47	3.083	4.525
404	25.29	45.36	9.26	44.24	55.75	3.658	4.610
458	23.62	45.53	5.48	48.11	51.88	2.327	2.509
489	24.09	44.78	6.42	46.19	53.80	2.400	2.795
492	24.49	45.95	5.55	46.69	53.30	2.326	2.655
499	22.26	39.18	7.19	43.18	56.81	2.967	3.903
595	23.21	38.54	8.15	39.77	60.22	3.300	4.996
616	22.94	38.61	11.06	40.58	59.41	4.844	7.090

Table 1.--Values of entries in the Stoneville and Texas cotton germplasm collections--Continued

Identification number	Seed-oil percentage	Embryo-oil percentage	Seed index	Seed-coat percentage	Embryo percentage	Seed-coat index	Embryo index
			TEXAS COLLECTION, 1969-70 IGUALA SEED--Continued				
TX 620	21.33	37.96	11.95	43.80	56.19	5.067	6.500
635	23.00	45.14	8.37	49.04	50.95	3.968	4.123
641	24.43	41.91	9.64	41.70	58.29	4.274	5.973
643	24.42	43.34	9.51	43.64	56.35	3.426	4.423
662	23.77	50.47	6.02	52.89	47.10	2.333	2.078
663	23.51	46.76	6.97	49.71	50.28	3.095	3.130
664	26.37	49.41	5.26	46.62	53.37	2.210	2.530
665	24.87	47.33	5.71	47.44	52.55	2.437	2.700
672	25.42	47.88	4.97	46.90	53.09	2.097	2.374
675	24.16	40.91	8.52	40.93	59.06	2.689	3.880
681	27.20	44.23	9.70	38.49	61.50	3.505	5.600
682	25.93	42.80	9.71	39.40	60.59	3.591	5.523
693	24.88	46.31	4.88	46.27	53.72	2.228	2.587
704	17.82	31.77	3.88	43.90	56.09	1.688	2.157
710	19.17	37.71	4.86	49.15	50.84	2.266	2.344
			TEXAS COLLECTION, 1970-71 IGUALA SEED				
TX 89	24.84	42.48	9.15	41.51	58.48	3.587	5.054
107	28.16	45.11	9.41	37.56	62.43	3.497	5.811
179	26.97	44.64	9.47	39.58	60.41	3.627	5.536
231	25.87	48.91	5.62	47.10	52.89	2.434	2.733
268	25.86	45.85	6.29	43.59	56.40	2.636	3.410
297	22.48	40.72	7.04	44.78	55.21	2.884	3.555
304	29.48	49.90	8.90	40.91	59.08	3.667	5.295
307	26.34	44.58	9.84	40.90	59.09	3.970	5.735
331	27.36	48.52	6.85	43.60	56.39	2.711	3.506
333	26.45	43.86	6.35	39.69	60.30	2.455	3.730
475	24.02	43.19	6.09	44.38	55.61	2.579	3.231
477	24.71	46.83	5.78	47.22	52.77	2.532	2.830
595	26.26	47.47	8.96	44.67	55.32	3.542	4.387
616	23.70	39.99	11.52	40.72	59.27	4.603	6.700
620	23.91	45.01	11.20	46.87	53.12	4.900	5.553
635	24.52	44.57	8.59	44.97	55.02	3.510	4.295
641	27.36	46.30	10.35	40.90	59.09	4.190	6.053
643	28.32	44.19	10.22	35.90	64.09	3.361	6.000
655	25.72	48.01	6.12	46.42	53.57	2.686	3.100
657	25.05	45.75	6.24	45.23	54.76	2.585	3.129
658	25.39	49.28	6.69	48.47	51.52	2.728	2.900
663	25.92	45.24	6.48	42.70	57.29	2.642	3.544
675	27.68	50.00	6.96	44.63	55.36	2.664	3.304
680	21.61	45.22	5.65	52.20	47.79	2.943	2.694
687	25.38	46.31	5.79	45.19	54.80	2.345	2.844
695	22.88	42.30	4.58	45.90	54.09	1.961	2.311
698	22.27	41.47	5.03	46.30	53.70	2.257	2.618
699	24.58	45.92	6.72	46.46	53.53	2.547	2.934
707	24.52	42.70	6.79	42.57	57.42	2.443	3.295
733	25.73	44.22	6.49	41.81	58.18	2.517	3.502
735	27.85	47.25	6.58	41.05	58.94	2.459	3.531
753	22.48	38.69	9.99	41.89	58.10	3.472	4.815

alone. There is a greater separation of the two collections and a greater variation within each collection for embryo-oil percentage (fig. 2) than for seed-oil percentage. The Stoneville collection had a mean embryo-oil percentage of 40.3, compared with 46.9 for the Texas collection. The Texas collection had a more variable range from 32.0 to 63.0 percent, compared with 27.0 to 50.6 percent for the Stoneville entries. Thus, variation in factors other than embryo-oil percentage alone contribute to the variation observed in seed oil.

Seed size and seed-coat and embryo percentages are components of overall seed quality. Recent varietal developments have tended toward small seeds, but in general large seeds are desirable for processing. Seed size in the Texas collection varies widely (fig. 3), but the mean seed index of 7.9 is smaller than cultivated cottons. The range is from 3.7 to 14.2. The Stoneville collection had a mean of 10.6 and range of 7.5 to 14.9. The upper limit of seed size does not differ greatly, but a large number of entries with small seeds characterized the Texas collection.

Seeds were separated into seed coat and embryo. The Stoneville collection had a smaller mean percentage of seed coat (38.1 vs. 44.5) and smaller range (30.4 to 51.6 vs. 33.0 to 63.0) than the Texas collection (fig. 4). I believe that the large seed-coat

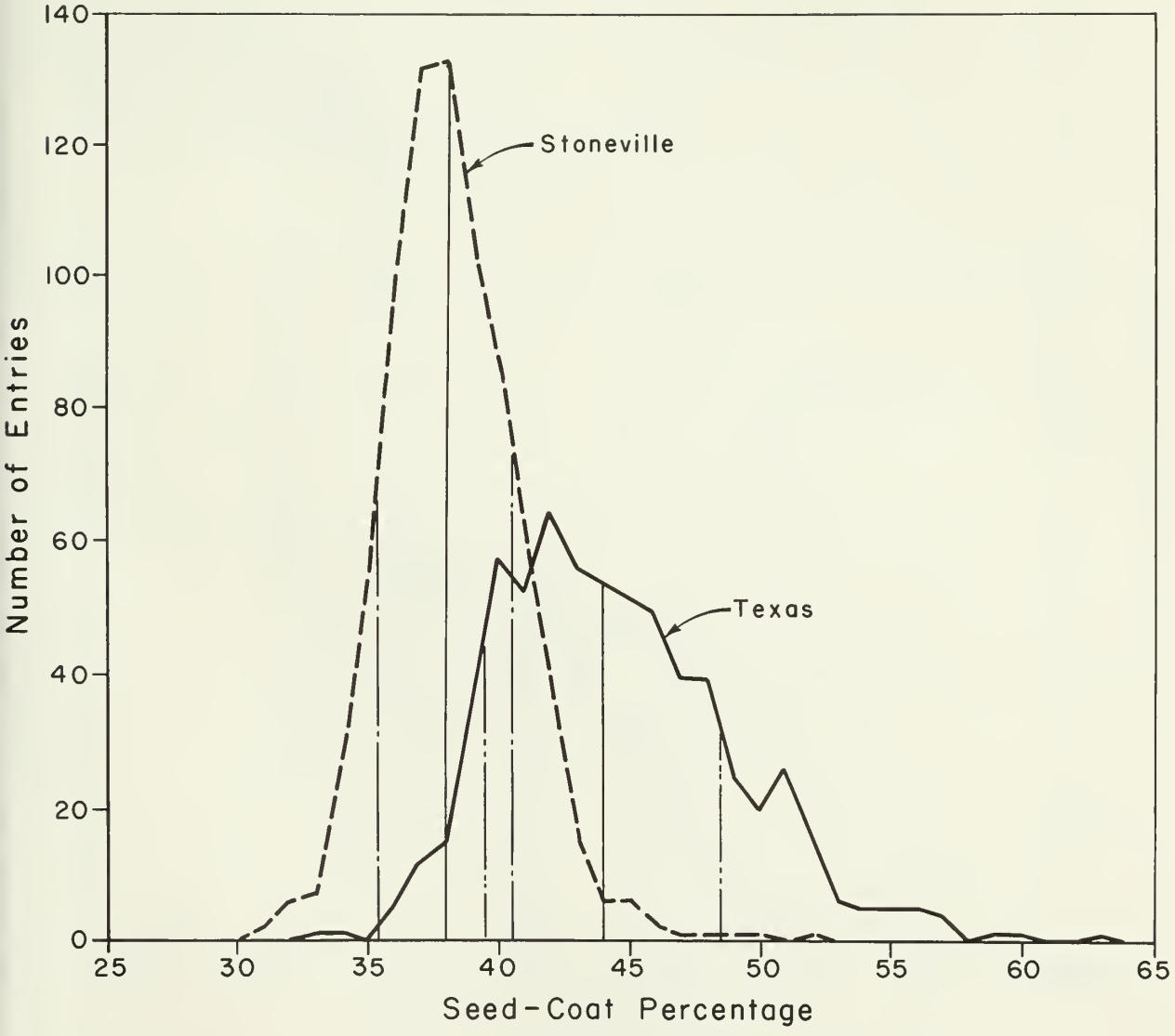

FIGURE 4.—Distribution of seed-coat percentages for the Stoneville and Texas cotton germplasm collections. The solid vertical lines represent the means, and the dashed vertical lines represent one standard deviation from the mean.

percentage of the Texas entries is a function of the small seed size, assuming that the seed coats are relatively uniform in thickness.

The percentage of embryo was calculated, but because it is equal to 100 minus the percentage of seed coat, the discussion of seed-coat percentage adequately covers the role and distribution of embryo percentage (fig. 5).

The gram weight of seed coats per 100 seeds was expressed as a seed-coat index (fig. 6). This character, the product of seed index times the seed-coat percentage, had a mean value of 3.9 and range of 2.4 to 5.5 for the Stoneville collection, and a mean of 3.3 and range of 2.0 to 5.5 for the Texas collection. In an analogous manner, the embryo index was calculated (fig. 7). The mean embryo index of the Stoneville collection was 6.3, with a range of from 3.8 to 9.1, and a mean of 4.2, with a range of 1.0 to 7.6 for the Texas collection.

Relationship of Seed-Quality Characters

The simple correlation coefficients of seed-oil percentage, embryo-oil percentage, seed index, embryo percentage, and embryo index were determined for the entries of both collections (table 2). The correlations were significantly different from zero in all cases except between embryo-oil percentage and seed index in the Stoneville collection. The

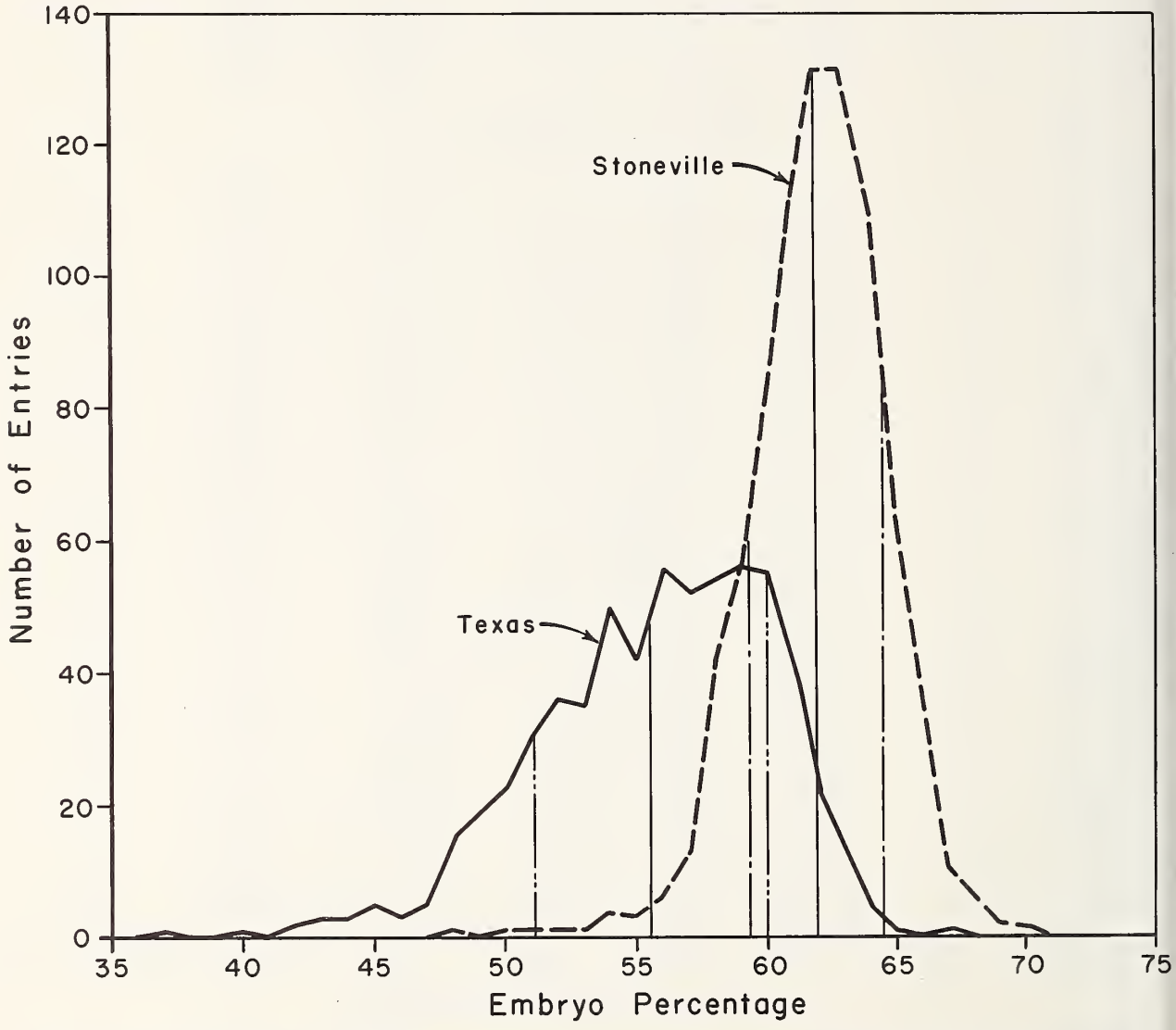

Figure 5.—Distribution of embryo percentages for the Stoneville and Texas cotton germplasm collections. The solid vertical lines represent the means, and the dashed vertical lines represent one standard deviation from the mean.

Table 2.--Simple correlation coefficients between various characteristics of the Stoneville and Texas cotton germplasm collections

Characteristic	Embryo index	Embryo percentage	Seed index	Embryo-oil percentage
Seed-oil percentage:				
Stoneville collection . .	0.15	0.22	0.14	0.82
Texas collection	.18	.39	.14	.50
Embryo-oil percentage:				
Stoneville collection . .	-.16	-.38	[1].04	. . .
Texas collection	-.50	-.58	-.35	. . .
Seed index:				
Stoneville collection . .	.85	.18	. . .	. . .
Texas collection	.92	.54	. . .	. . .
Embryo percentage:				
Stoneville collection . .	.52	. . .	. . .	. . .
Texas collection	.74	. . .	. . .	. . .

[1]Not significantly different from $r=0.00$.

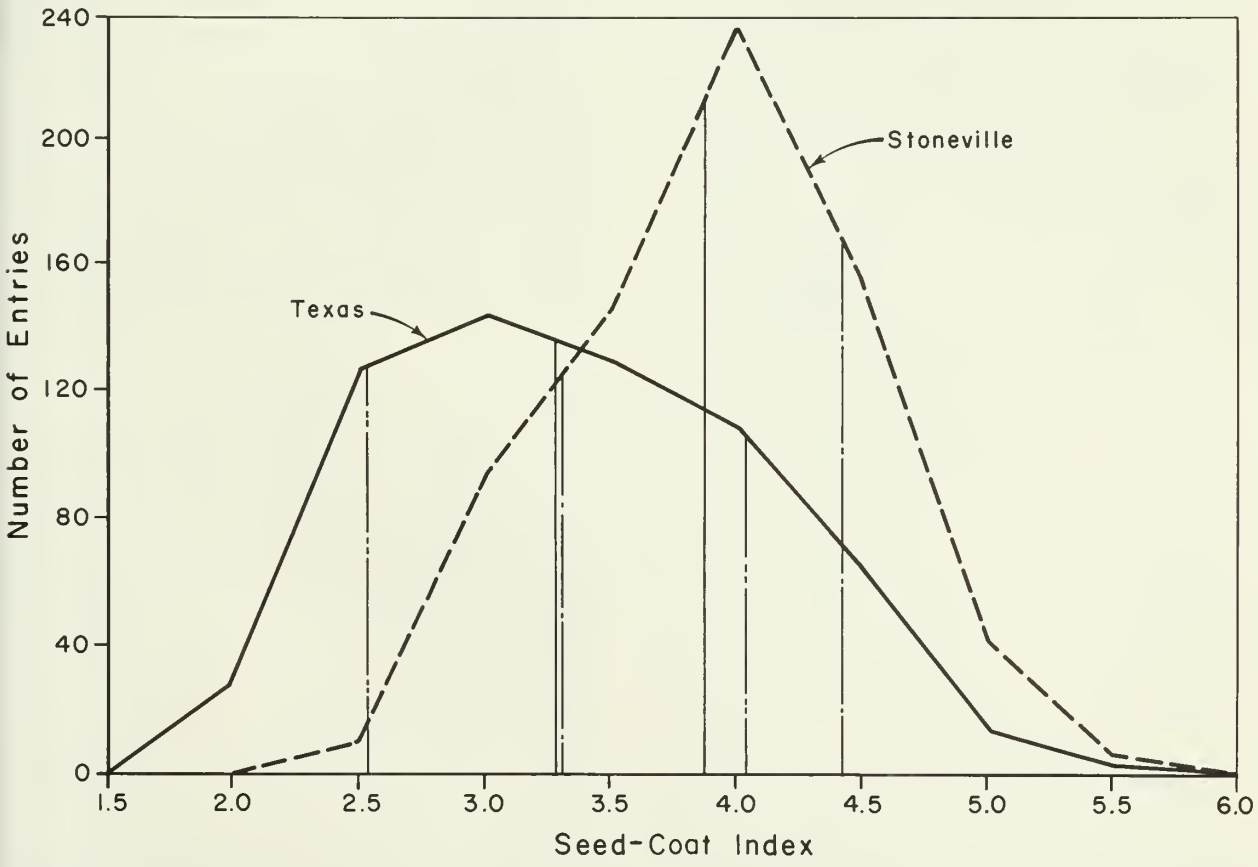

FIGURE 6.—Distribution of seed-coat indexes for the Stoneville and Texas cotton germplasm collections. The solid vertical lines represent the means, and the dashed vertical lines represent one standard deviation from the mean.

Table 3.--Stepwise regression for seed-oil percentages[1] in the Stoneville and Texas cotton germplasm collections

R_2		Independent variable				
Stoneville	Texas	Embryo-oil percentage	Embryo percentage	Embryo index	Seed-coat index	Seed-coat percentage
0.6672	0.2586	X	. . .	. . .	. . .	. . .
.9963	.9671	X	X	. . .	. . .	. . .
.9963	.9676	X	X	X	. . .	. . .
.9964	.9712	X	X	X	X	. . .
.9964	.9720	X	X	X	X	X

[1]All combinations are significant at the 0.05 level of probability.

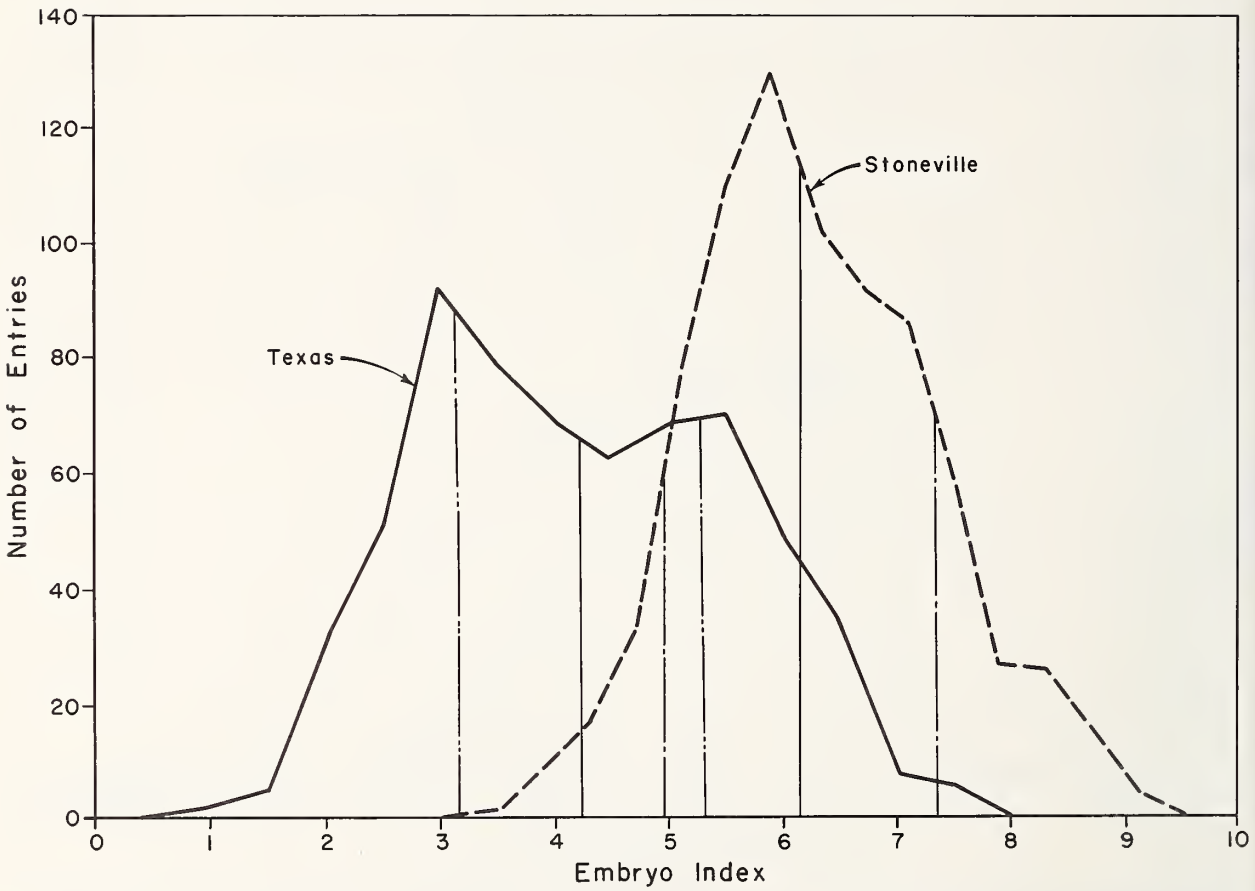

FIGURE 7.—Distribution of embryo indexes for the Stoneville and Texas cotton germplasm collections. The solid vertical lines represent the means, and the dashed vertical lines represent one standard deviation from the mean.

Stoneville collection had smaller correlation values for each comparison, except seed-oil percentage and embryo-oil percentage, than did the Texas collection. The higher correlations of the Texas collection probably resulted from the wide range of the entries, especially among the physical properties of the seeds.

Seed-oil percentage is positively correlated with seed size and size of the embryo (seed index, embryo percentage, and embryo index). However, embryo-oil percentage is negatively correlated with these factors, except for the nonsignificant correlation of embryo-oil percentage and seed size in the Stoneville collection. Because the relative proportion of the embryo increases as the seed size increases ($r=0.85$ and 0.92 between seed index and embryo index, respectively), the total amount of oil in the seed and embryo increases, but the increase in embryo oil does not increase in direct proportion to the increase in embryo size.

A stepwise regression was performed to determine the relative contribution to seed-oil percentage by embryo-oil percentage, embryo percentage, embryo index, seed-coat index, seed-coat percentage, and seed index (table 3). For both collections, the order of variables contributing to seed-oil percentage was the same, and seed index did not add significantly to the regression. The five combinations were all significant ($P=0.10$), but the first two represent the major contributions to seed-oil percentage. The results are interesting, but not particularly revealing, in that they demonstrate that seed-oil percentage is determined principally by the percentage of oil in the embryo and the size of the embryo.

CONCLUSIONS

The purpose of this investigation was to survey the two germplasm collections most immediately available for Upland cotton improvement for variability in seed oil and physical properties of the seeds. The survey shows a wide range of variability for all characters measured. The greater variability is in the more genetically diverse Texas collection. We do not know how much of the variability can be attributed to environmental factors, but even knowing from other investigations that seed oil has a relatively large environmental component, we can observe that considerable variability remains. The question of how large is the environmental variability relative to genetic sources of variation will have to be answered, but the most important question is: To what extent can this genetic variability of seed-quality factors be used in combination with desirable agronomic traits?

Now, individual entries must be selected for genetic analysis of seed oil. With respect to the Texas collection, the task will be difficult because day-neutral types that retain the desired characteristics must first be developed.

The nondestructive NMR method made it possible to determine the oil content of these germplasm collections. Another major seed-quality determinant that should be surveyed in the germplasm collections is seed protein, but there is no nondestructive method available for the determination of protein. At present, the large number of entries and the limited amount of available seed per entry, principally in the Texas collection, precludes the utilization of destructive methods of analysis.

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